BCAC ADM Item 15 IFC temporary structures (6558)

IFC: SECTION 105, 105.5, 105.5.38, 105.5.49, [A] 105.6, [A] 105.6.21, [A] 105.6.24, SECTION 3103, 3103.2, 3103.4, SECTION 3105, 3105.2, 3105.3, SECTION 3106, 3106.2.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

SECTION 105 PERMITS

105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.2 through 105.5.52.

105.5.38 Outdoor assembly event. An operational permit is required to conduct an *outdoor assembly event* where planned attendance exceeds 1,000 persons.

Revise as follows:

105.5.49 Temporary membrane structures, temporary special event structures and tents.
An operational permit is required to operate an air-supported temporary membrane structure, a temporary *special event structure* or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains, or extensions attached thereto, when used for funeral services.

~~2.~~ 3. Tents open on all sides, which comply with all of the following:

   ~~2.1.~~ 3.1. Individual tents having a maximum size of 700 square feet (65 m^2).

   ~~2.2.~~ 3.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.

   ~~2.3.~~ 3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

[A] 105.6 Required construction permits. The *fire code official* is authorized to issue construction permits for work as set forth in Sections 105.6.1 through 105.6.24.

Revise as follows:

[A] 105.6.21 Temporary Special event structure. A single construction permit is required to erect and take down a *temporary special event structure* as set forth in Section 105.5.49.

[A] 105.6.24 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, ~~a temporary stage canopy~~ or a tent ~~having an area in excess of 400 square feet (37 m^2)~~ as set forth in Section 105.5.49.

~~Exceptions:~~

1. ~~Tents used exclusively for recreational camping purposes.~~
2. ~~Funeral tents and curtains, or extensions attached thereto, when used for funeral services.~~
3. ~~Tents and awnings open on all sides, which comply with all of the following:~~

   ~~3.1. Individual tents shall have a maximum size of 700 square feet (65 m^2).~~

   ~~3.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.~~

   ~~3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.~~

SECTION 3103 TEMPORARY TENTS AND MEMBRANE STRUCTURES

Revise as follows:

3103.2 Approval required. *Tents* and *membrane structures* required to have a permit as set forth in Sections 105.5 and 105.6 ~~having an area in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

~~**Exceptions:**~~

~~1. *Tents* used exclusively for recreational camping purposes.~~

~~2. *Tents* open on all sides that comply with all of the following:~~

~~2.1. Individual *tents* having a maximum size of 700 square feet (65 m^2).~~

~~2.2. The aggregate area of multiple *tents* placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m^2) total.~~

~~2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other *tents*.~~

Delete without substitution:

~~**3103.4 Permits.**~~
~~Permits shall be required as set forth in Sections 105.5 and 105.6.~~

SECTION 3105 TEMPORARY SPECIAL EVENT STRUCTURES

Revise as follows:

3105.2 Approval. Temporary special event structures structures required to have a permit as set forth in Sections 105.5 and 105.6 ~~in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining approval and a permit from the *fire code official* and the building official.

Delete without substitution:

~~**3105.3 Permits.**~~
~~Permits shall be required as set forth in Sections 105.5 and 105.6.~~

SECTION 3106 OUTDOOR ASSEMBLY EVENTS

3106.2.2 Permits. An operational permit shall be required as set forth in Section 105.5.

Reason Statement: The intent of this proposal is to eliminate duplication of code language and consistent use of the defined terms and approach to references. In looking at requirements for temporary membrane structures, temporary special event structures and tents in Permits and Chapter 31 has indicated an inconsistency in terminology. This deletion of text will not change requirements, but instead put the criteria in one location so it will remain consistent over time.

This proposal is submitted by the ICC 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 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 BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial revision that is only removing redundant text.

BCAC ADM Item 15 IFC temporary structures (6558)

BCAC Egress Item 10 Accessible vs. Access (to) (6593)

IBC: SECTION 202 (New), [F] 415.11.7.4, 703.5, [F] 914.1.1, [P] 1210.2.2, 1607.9.1, 1607.14.4.4, 1704.2.2, 2111.3.1, 2113.9.2, 2405.3, 2406.4.3, 3008.9, F101.5.1, H110.1; ICCPC: SECTION 202 (New), [P] 1204.3.3, [F] 2001.3.6; IFC: SECTION 202, 504.1, 509.2, 701.6, 2309.5.2.1, 3206.10.1.1, L104.6, L104.14.1, D102.1; IFGC: SECTION 202, [M] 306.1, 403.11.7, 409.5.3, 409.6, 501.7.3, 503.5.9, 503.12.6, 404.8.2, 404.14.2, 411.1.6; IPC: SECTION 202, 1302.9; IPMC: [BF] 703.3; IMC: 306.1, 506.3.2.2; ISPSC: SECTION 202, SECTION 202 (New), [A] 110.1, 303.1.1, 306.9, 313.4, 314.5, 324.2, 409.4.3, 504.1, 603.2, 612.5.1, 1001.6, 704.7.3, 704.7.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Joseph Summers, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction [see also Ready access (to)].

READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction [see Access (to)].

Revise as follows:

[F] 415.11.7.4 Installations in corridors and above other occupancies.
The installation of HPM piping and tubing within the space defined by the walls of corridors and the floor or roof above, or in concealed spaces above other occupancies, shall be in accordance with Sections 415.11.7.1 through 415.11.7.3 and the following conditions:

1. Automatic sprinklers shall be installed within the space unless the space is less than 6 inches (152 mm) in the least dimension.

2. *Ventilation* not less than six air changes per hour shall be provided. The space shall not be used to convey air from any other area.

3. Where the piping or tubing is used to transport HPM liquids, a receptor shall be installed below such piping or tubing. The receptor shall be designed to collect any discharge or leakage and drain it to an *approved* location. The 1-hour enclosure shall not be used as part of the receptor.

4. HPM supply piping and tubing and nonmetallic waste lines shall be separated from the corridor and from occupancies other than Group H-5 by *fire barriers* or by an approved method or assembly that has a *fire-resistance rating* of not less than 1 hour. Access openings into the enclosure shall be protected by approved fire-protection-rated assemblies.

5. ~~Readily accessible manual~~ Ready access to manual or automatic remotely activated fail-safe emergency shutoff valves , that are provided with ready access, shall be installed on piping and tubing other than waste lines at the following locations:

    5.1. At branch connections into the *fabrication area*.

    5.2. At entries into *corridors*.

Exception: Transverse crossings of the *corridors* by supply piping that is enclosed within a ferrous pipe or tube for the width of the *corridor* need not comply with Items 1 through 5.

703.5 Marking and identification. Where there is ~~an accessible~~ access to a concealed floor, floor-ceiling or *attic* space, *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and *smoke partitions* or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:

1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition.
2. Include lettering not less than 3 inches (76 mm) in height with a minimum $^{3}/_{8}$-inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS,” or other wording.

[F] 914.1.1 Exterior access to shaftways. Outside openings ~~accessible~~ with access to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word “SHAFTWAY” in red letters not less than 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

[P] 1210.2.2 Walls and partitions.
Walls and partitions within 2 feet (610 mm) of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of not less than 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exception: This section does not apply to the following buildings and spaces:

1. Dwelling units and *sleeping units*.
2. Toilet rooms that are not ~~accessible to the~~ for use by the general public and that have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

1607.9.1 Handrails and guards.
Handrails and *guards* shall be designed to resist a linear *load* of 50 pounds per linear foot (plf) (0.73 kN/m) in accordance with Section 4.5.1.1 of ASCE 7. Glass *handrail* assemblies and *guards* shall comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated *load* required by Section 1607.9.1.1 shall be applied.

2. In Group I-3, F, H and S occupancies, for areas that are not ~~accessible to~~ for use by the general public and that have an *occupant load* less than 50, the minimum *load* shall be 20 pounds per foot (0.29 kN/m).

1607.14.4.4 Ground-mounted photovoltaic (PV) panel systems. or modules installed as an independent structure. Ground-mounted photovoltaic (PV) panel systems that are independent structures and do not have ~~accessible/~~ an easily accessed or occupied space underneath are not required to accommodate a roof photovoltaic *live load*. Other *loads* and combinations in accordance with Section 1605 shall be accommodated.

1704.2.2 Access for special inspection. The construction or work for which *special inspection* or testing is required shall remain ~~accessible and~~ exposed and with access for *special inspection* or testing purposes until completion of the required *special inspections* or tests.

2111.3.1 Ash dump cleanout. Cleanout openings, located within foundation walls below fireboxes, where provided, shall be equipped with ferrous metal or masonry doors and frames constructed to remain tightly closed, except when in use. Cleanouts shall ~~be accessible~~ provide access to and be located so that ash removal will not create a hazard to combustible materials.

2113.9.2 Spark arrestors. Where a spark arrestor is installed on a masonry chimney, the spark arrestor shall meet all of the following requirements:

1. The net free area of the arrestor shall be not less than four times the net free area of the outlet of the chimney flue it serves.
2. The arrestor screen shall have heat and *corrosion resistance* equivalent to 19-gage galvanized steel or 24-gage stainless steel.
3. Openings shall not permit the passage of spheres having a diameter greater than $^1/_2$ inch (12.7 mm) nor block the passage of spheres having a diameter less than $^3/_8$ inch (9.5 mm).
4. The spark arrestor shall ~~be accessible~~ provide access for cleaning and the screen or chimney cap shall be removable to allow for cleaning of the chimney flue.

2405.3 Screening.
Where used in monolithic glazing systems, annealed, heat-strengthened, fully tempered and wired glass shall have broken glass retention screens installed below the glazing material. The screens and their fastenings shall be: capable of supporting twice the weight of the glazing; firmly and substantially fastened to the framing members; and installed within 4 inches (102 mm) of the glass. The screens shall be constructed of a noncombustible material not thinner than No. 12 B&S gage (0.0808 inch) with mesh not larger than 1 inch by 1 inch (25 mm by 25 mm). In a corrosive atmosphere, structurally equivalent noncorrosive screen materials shall be used. Annealed, heat-strengthened, fully tempered and wired glass, where used in multiple-layer glazing systems as the bottom glass layer over the walking surface, shall be equipped with screening that conforms to the requirements for monolithic glazing systems.

Exception: In monolithic and multiple-layer sloped glazing systems, the following applies:

1. Fully tempered glass installed without protective screens where glazed between intervening floors at a slope of 30 degrees (0.52 rad) or less from the vertical plane shall have the highest point of the glass 10 feet (3048 mm) or less above the walking surface.
2. Screens are not required below any glazing material, including annealed glass, where the walking surface below the glazing material is permanently protected from the risk of falling glass or the area below the glazing material is not a walking surface.
3. Any glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing systems of commercial or detached noncombustible *greenhouses* used exclusively for growing plants and not open to the public, provided that the height of the *greenhouse* at the ridge does not exceed 30 feet (9144 mm) above grade.
4. Screens shall not be required in individual *dwelling units* in Groups R-2, R-3 and R-4 where fully tempered glass is used as single glazing or as both panes in an insulating glass unit, and the following conditions are met:

    4.1. Each pane of the glass is 16 square feet (1.5 m^2) or less in area.

    4.2. The highest point of the glass is 12 feet (3658 mm) or less above any walking surface ~~or other accessible area~~.

    4.3. The glass thickness is $^3/_{16}$ inch (4.8 mm) or less.

5. Screens shall not be required for laminated glass with a 15-mil (0.38 mm) polyvinyl butyral (or equivalent) interlayer used in individual *dwelling units* in Groups R-2, R-3 and R-4 within the following limits:

   5.1. Each pane of glass is 16 square feet (1.5 m^2) or less in area.

   5.2. The highest point of the glass is 12 feet (3658 mm) or less above a walking surface ~~or other accessible area~~.

2406.4.3 Glazing in windows. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:

1. The exposed area of an individual pane is greater than 9 square feet (0.84 m^2).
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor.
3. The top edge of the glazing is greater than 36 inches (914 mm) above the floor.
4. One or more walking surface(s) are within 36 inches (914 mm), measured horizontally and in a straight line, of the plane of the glazing.

Exceptions:

1. Decorative glazing.
2. Where a horizontal rail is installed on the ~~accessible~~ walking surface side(s) of the glazing adjacent to and 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal *load* of 50 pounds per linear foot (730 N/m) without contacting the glass and be not less than $1^1/_2$ inches (38 mm) in cross-sectional height.
3. Outboard panes in insulating glass units or multiple glazing where the bottom exposed edge of the glass is 25 feet (7620 mm) or more above any grade, roof, walking surface or other horizontal or sloped (within 45 degrees of horizontal) (0.79 rad) surface adjacent to the glass exterior.

3008.9 Emergency voice/alarm communication system. The building shall be provided with an *emergency voice/alarm communication system*. The *emergency voice/alarm communication system* shall ~~be accessible to~~ allow access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

F101.5.1 Rodent ~~accessible~~ attainable openings. Windows and other openings for the purpose of light and ventilation in the *exterior walls* not covered in this chapter, ~~accessible~~ attainable to rodents by way of exposed pipes, wires, conduits and other appurtenances, shall be covered with wire cloth of at least 0.035-inch (0.89 mm) wire. In lieu of wire cloth covering, said pipes, wires, conduits and other appurtenances shall be blocked from rodent usage by installing solid sheet metal guards 0.024 inch (0.61 mm) thick or heavier. Guards shall be fitted around pipes, wires, conduits or other appurtenances. In addition, they shall be fastened securely to and shall extend perpendicularly from the *exterior wall* for not less than 12 inches (305 mm) beyond and on either side of pipes, wires, conduits or appurtenances.

H110.1 General.
Roof signs shall be constructed entirely of metal or other approved noncombustible material except as provided for in Sections H106.1.1 and H107.1. Provisions shall be made for electric grounding of metallic parts. Where combustible materials are permitted in letters or other ornamental features, wiring and tubing shall be kept free and insulated therefrom. Roof signs shall be so constructed as to leave a clear space of not less than 6 feet (1829 mm) between the roof level and the lowest part of the sign and shall have not less than 5 feet (1524 mm) clearance between the vertical supports thereof. Roof sign structures shall not project beyond an *exterior wall*.

Exception: Signs on flat roofs with every part of the roof ~~accessible~~ allowing access.

2021 International Code Council Performance Code

Add new definition as follows:

[M] READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction [see "Access (to)"].

[M] ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction [see also "Ready access (to)"].

Revise as follows:

[P] 1204.3.3 ~~Accessibility~~ Access. The drainage system shall ~~be accessible~~ have access for maintenance and clearing of blockages.

[F] 2001.3.6 Water supply. Water supply for fire department operations shall be from a reliable~~, readily accessible~~ source with ready access acceptable to the fire department and capable of supporting fire-fighting operations.

2021 International Fire Code

OCCUPANCY CLASSIFICATION. For the purposes of this code, certain occupancies are defined as follows:

Revise as follows:

504.1 Required access. Exterior doors and openings required by this code or the *International Building Code* shall be maintained ~~readily accessible~~ with ready access for emergency access by the fire department. An *approved* access walkway leading from fire apparatus access roads to exterior openings shall be provided where required by the *fire code official*.

509.2 Equipment access. *Approved* access shall be provided and maintained for all *fire protection system* equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from ~~being readily accessible~~ ready access.

701.6 Owner's responsibility. The *owner* shall maintain an inventory of all required *fire-resistance-rated* construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the *International Building Code*. Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is ~~accessible~~ available by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

2309.5.2.1 Identification. Manual emergency shutoff valves shall be identified and the location shall be clearly visible, ~~accessible~~ have access and be indicated by means of a sign.

3206.10.1.1 Sprinklered buildings.
Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are ~~accessible~~ open to the public and designated to contain high-hazard commodities.

Aisles shall be not less than 96 inches (2438 mm) wide in areas open to the public where mechanical stocking methods are used.

Exceptions:

1. Aisles in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by a sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches (1118 mm) wide.
2. Aisles that are in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, not open to the public and protected by a sprinkler system designed for multiple-row racks, shall be not less than 24 inches (610 mm) wide.

L104.6 Isolation valves. System isolation valves that ~~are accessible to~~ have access for the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked.

MULTIPLE-LEVEL BOOTH. An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is ~~accessible~~ open to the public, or includes a live load above the exhibit area floor level.

L104.14.1 Location. The location of the external mobile air connection shall ~~be accessible to~~ have access for mobile air apparatus and *approved* by the *fire code official*.

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall ~~be accessible to~~ allow access for the fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing up to 75,000 pounds (34 050 kg).

2021 International Fuel Gas Code

Revise as follows:

[M] ACCESS (TO). That which enables a device,*appliance* or *equipment* to be reached by ready *access* or by a means that first requires the removal or movement of a panel~~, door~~ or similar obstruction (see also "Ready access").

[M] READY ACCESS (TO). That which enables a device,*appliance* or *equipment* to be directly reached, without requiring the removal or movement of any panel~~, door~~ or similar obstruction (see *"Access"*).

[M] 306.1 Access for maintenance and replacement. Appliances, control devices, heat exchangers and HVAC components that utilize energy shall ~~be accessible~~ have access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, or any other *piping* or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be provided in front of the control side to service an *appliance*.

403.11.7 Lapped flanges. Lapped flanges shall be used only above ground or in exposed locations ~~accessible~~ with access for inspection.

409.5.3 Located at manifold. Where the *appliance* shutoff valve is installed at a manifold, such shutoff valve shall be located within 50 feet (15 240 mm) of the *appliance* served and shall ~~be readily accessible~~ have ready access and be permanently identified. The *piping* from the manifold to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with Sections 401 through 408.

409.6 Shutoff valve for laboratories. Where provided with two or more fuel gas outlets, including table-, bench- and hood-mounted outlets, each laboratory space in educational, research, commercial and industrial *occupancies* shall be provided with a single dedicated shutoff valve through which all such gas outlets shall be supplied. The dedicated shutoff valve shall ~~be readily accessible~~ have ready access, be located within the laboratory space served, be located adjacent to the egress door from the space and shall be identified by *approved* signage stating "Gas Shutoff."

501.7.3 Connection to masonry fireplace flue. A connector shall extend from the *appliance* to the flue serving a masonry *fireplace* such that the flue gases are exhausted directly into the flue. The connector shall ~~be accessible~~ have access or be removable for inspection and cleaning of both the connector and the flue. *Listed* direct connection devices shall be installed in accordance with their listing.

503.5.9 Cleanouts. Where a chimney that formerly carried flue products from liquid or solid fuel-burning appliances is used with an *appliance* using fuel gas, ~~an accessible~~ a cleanout with access shall be provided. The cleanout shall have a tight-fitting cover and shall be installed so its upper edge is not less than 6 inches (152 mm) below the lower edge of the lowest chimney inlet opening.

503.12.6 Positioning. Draft hoods and draft regulators shall be installed in the position for which they were designed with reference to the horizontal and vertical planes and shall be located so that the relief opening is not obstructed by any part of the *appliance* or adjacent construction. The *appliance* and its draft hood shall be located so that the relief opening ~~is accessible~~ has access for checking vent operation.

404.8.2 Conduit with both ends terminating indoors. Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in ~~an accessible~~ a portion of the building with access and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

404.14.2 Conduit with both ends terminating indoors. Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in ~~an accessible~~ a portion of the building with access and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

411.1.6 Unions. A union fitting shall be provided for *appliances* connected by rigid metallic pipe. Such unions shall ~~be accessible~~ have access and be located within 6 feet (1829 mm) of the *appliance*.

2021 International Plumbing Code

Revise as follows:

[M] ACCESS (TO). That which enables a fixture, appliance or equipment to be reached by*ready access* or by a means that first requires the removal or movement of a panel~~, door~~ or similar obstruction (see "Ready access").

[M] READY ACCESS. That which enables a fixture, appliance or equipment to be directly reached without requiring the removal or movement of any panel~~, door~~ or similar obstruction and without the use of a portable ladder, step stool or similar device.

1302.9 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be ~~easily accessible~~ have easy access and removable in order to perform repair, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be appropriate for the application and in accordance with Section 604 .

2021 International Property Maintenance Code

Revise as follows:

[BF] 703.3 Maintenance. The required fire-resistance rating of fire-resistance-rated construction, including walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and joint systems, shall be maintained. Such elements shall be visually inspected annually by the *owner* and repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space ~~is accessible~~ has access by the removal or movement of a panel, access door, ceiling tile or entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer and any other reason shall be protected with *approved* methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

2021 International Mechanical Code

Revise as follows:

306.1 Access. *Appliances*, controls devices, heat exchangers and HVAC system components that utilize energy shall ~~be accessible~~ provide access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

506.3.2.2 Duct-to-hood joints. Duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, ~~accessible~~ available for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:
   1.1. The hood duct opening shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.
   1.2. The duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the duct not less than 1 inch (25 mm) above the bottom end of the duct.
   1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between the duct flange and the top of the hood.
   1.4. The duct-to-hood joint shall be secured by stud bolts not less than $^1/_4$ inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.
2. *Listed* and *labeled* duct-to-hood collar connections installed in accordance with Section 304.1.

2021 International Swimming Pool and Spa Code

Delete without substitution:

~~**ACCESSIBLE.** Signifies access that requires the removal of an access panel or similar removable obstruction.~~

Add new definition as follows:

ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction [see also Ready access (to)].

READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction [see Access (to)].

Revise as follows:

[A] 110.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official* and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain ~~accessible~~ available and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

303.1.1 Heaters. The electric power to heaters shall be controlled by ~~a readily accessible~~ an on-off switch with ready access that is an integral part of the heater, mounted on the exterior of the heater or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

306.9 Valves under decks. Valves installed in or under decks shall be ~~accessible~~ provided access or operation, service, and maintenance. Where access through the deck walking surface is required, an access cover shall be provided for the opening in the deck. Such access covers shall be slip resistant and secured.

313.4 Location. Pumps and motors shall be ~~accessible~~ provided access for inspection and service in accordance with the manufacturer's specifications.

314.5 Vacuum fittings. Where installed, *submerged vacuum fittings* shall be ~~accessible~~ provided access and shall be located not greater than 12 inches (305 mm) below the water level.

324.2 Requirements. The equipment area or room floor shall be of concrete or other suitable material having a smooth slip-resistant finish and have positive drainage, including a sump drain pump, if necessary. Floors shall have a slope toward the floor drain or sump drain pump adequate to prevent standing water at all times. The opening to the equipment room or area shall be designed to provide access for all anticipated equipment. At least one hose bibb with backflow preventer shall be located in the equipment room or ~~be accessible~~ allow for access within an adequate distance of the equipment room so that a hose can service the entire room.

409.4.3 Emergency response units. Pools covered by this chapter shall be provided with first aid equipment, including a first aid kit. First aid equipment and kits shall be located in ~~an accessible location~~ to allow access.

504.1 Emergency shutoff switch. One emergency shutoff switch shall be provided to disconnect power to circulation and jet system pumps and air blowers. Emergency shutoff switches shall ~~be accessible~~ provide access, be located within sight of the spa and shall be located not less than 5 feet (1524 mm) but not greater than 10 feet (3048 mm) horizontally from the inside walls of the spa.

603.2 Class D-2 pools. Where a Class D-2 pool has a bather ~~accessible~~ depth greater than $4^1/_2$ feet (1372 mm), the floor shall have a distinctive marking at the $4^1/_2$ feet (1372 mm) water depth.

612.5.1 Water collection and treatment tank. Interactive water play features shall drain to a collection and treatment tank. The inside of the tank shall ~~be accessible~~ provide access for cleaning and inspection. The access hatch or lid shall be locked or require a tool to open.
The tank capacity shall be not less than 1000 gallons or ten times the number of gallons in a minute when all nozzles are operating simultaneously, whichever is greater. The volume water in the tank, at the design water level, shall not decrease more than 15% of that volume when all pumps and discharge piping fill with water to the discharge points of all nozzles.
Tanks shall be provided with a means to empty all water in the tank for the purposes of servicing or cleaning.

1001.6 Access. Electrical components that require placement or servicing shall be ~~accessible~~ located with access.

704.7.3 Pump shutoff valves. An ~~*accessible*~~ available means of ~~shut~~ shutting off ~~of~~ the suction and discharge piping for the pump shall be provided for maintenance and removal of the pump and be located with access.

704.7.2 ~~Accessible~~ Access to pumps and motors. Pumps and motors shall be ~~accessible~~ provided access for inspection and service in accordance with the pump and motor manufacturer's instructions.

Reason Statement: This effort was started by the CACs in 2015/16 code change cycle, and continued in 2018/19. This proposal is to provide_coordination with the action taken with -P84-15, M2-15, RB2-16, F12-16, CE137-16 Part 1, CE29-19 Part 1 and 2 . Because the term 'accessible' is most commonly understood as requiring access for persons with disabilities we are making the changes to delete the word accessible from the remaining codes and replace it with other words, defined terms or phrases that are not attributed to requiring access for the physically disabled. Many of the codes use the defined term 'access (to)' or 'ready access (to)' for access by maintenance and service personnel or fire departments. This proposal provides clarity and consistency in the remaining codes where those coordination modifications missed or came in as part of new code changes.

Code change proposal M2-15 removed 'door' from the definitions for 'access (to)' and 'ready access (to)'. That coordination item did not happen across codes and this proposal seeks to complete that effort.

Similar proposals will be submitted for the Group B cycle for IRC, IECC and IEBC.

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

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: PMGCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change to any of the requirements. This is only a clarification in terminology.

BCAC Egress Item 6 corridor continuity Proposal 1 elevator hoistway (6872)

IBC: 713.14, 716.2.6.1, SECTION 3002, 3002.1, 3002.1.1, 3002.1.2, 3002.2, 3002.6, SECTION 3006, 3006.1, 3006.2, 3006.3

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

713.14 Elevator, dumbwaiter and other hoistways. ~~Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Sections 712 and~~ A hoistway for elevators, dumbwaiters and other vertical devices shall comply with Section 712. Where the hoistway is required to be enclosed, it shall be constructed as a shaft enclosure in accordance with Section 713, and Chapter 30.

716.2.6.1 Door closing.
Fire doors shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated elevator hoistway ~~enclosure~~ doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

SECTION 3002 HOISTWAY ENCLOSURES

Revise as follows:

3002.1 Hoistway ~~enclosure~~ protection. ~~Elevator, dumbwaiter and other hoistway enclosures shall be *shaft enclosures* complying with Sections 712 and 713.~~ A hoistway for elevators, dumbwaiters and other vertical access devices shall be comply with Sections 712 and 713. Where the hoistway is required to be enclosed it shall be constructed as a shaft enclosure in accordance with Section 713.

3002.1.1 Opening protectives.
Openings in fire-resistant rated hoistway enclosures shall be protected as required in Chapter 7.

Exception: The elevator car doors and the associated elevator hoistway ~~enclosure~~ doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I Emergency Recall Operation.

3002.1.2 Hardware. Hardware on ~~opening protectives~~ elevator hoistway doors shall be of an *approved* type installed as tested, except that *approved* interlocks, mechanical locks and electric contacts, door and gate electric contacts and door-operating mechanisms shall be exempt from the fire test requirements.

3002.2 Number of elevator cars in a hoistway. Where four or more elevator cars serve all or the same portion of a building, the elevators shall be located in not fewer than two separate fire-resistance rated hoistways. Not more than four elevator cars shall be located in any single fire-resistance rated hoistway enclosure.

3002.6 Prohibited doors or other devices. Doors or other devices, other than ~~hoistway doors and~~ the elevator car door and the associated elevator hoistway doors, shall be prohibited at the point of access to an elevator car unless such doors or other devices are readily openable from inside the car ~~side~~ without a key, tool, special knowledge or effort.

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY ~~OPENING~~ DOOR PROTECTION

3006.1 General. ~~Elevator hoistway openings and enclosed~~ Enclosed elevator lobbies and elevator hoistway door protection shall be provided in accordance with the following:

1. Where elevator hoistway door ~~opening~~ protection is required by Section 3006.2, such protection shall be provided in accordance with Section 3006.3.
2. Where enclosed elevator lobbies are required for underground buildings, such lobbies shall comply with Section 405.4.3.
3. Where an *area of refuge* is required and an enclosed elevator lobby is provided to serve as an *area of refuge*, the enclosed elevator lobby shall comply with Section ~~1009.6~~ 1009.6.4.
4. Where fire service access elevators are provided, enclosed elevator lobbies shall comply with Section 3007.6.
5. Where occupant evacuation elevators are provided, enclosed elevator lobbies shall comply with Section 3008.6.

3006.2 Elevator hoistway door ~~Hoistway opening~~ protection required.
Elevator hoistway ~~door openings~~ doors shall be protected in accordance with Section 3006.3 where an elevator hoistway connects more than three *stories*, is required to be enclosed within a *shaft enclosure* in accordance with Section 712.1.1 and any of the following conditions apply:

1. The building is not protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The building contains a Group I-1, Condition 2 occupancy.
3. The building contains a Group I-2 occupancy.
4. The building contains a Group I-3 occupancy.

5. The building is a high rise and the elevator hoistway is more than 75 feet (22 860 mm) in height. The height of the hoistway shall be measured from the *lowest floor* to the highest floor of the floors served by the hoistway.

Exceptions:

1. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required where the elevator serves only *open parking garages* in accordance with Section 406.5.
2. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required at the level(s) of exit discharge, provided that the level(s) of exit discharge is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. ~~Enclosed elevator lobbies and protection~~ Protection of elevator hoistway ~~door openings~~ doors are not required on levels where the elevator hoistway door opens to the exterior.

3006.3 Elevator hoistway door ~~Hoistway opening~~ protection.
Where Section 3006.2 requires protection of the elevator hoistway door ~~opening~~, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor by *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the elevator lobby enclosure walls shall comply with Section 716.2.2.1 as required for *corridor* walls. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor by *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors or other devices shall be provided at each elevator hoistway door ~~opening~~ in accordance with Section 3002.6. Such door or other devices shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.

BCAC Egress Item 6 corridor continuity Proposal 4 (6871)

IBC: 707.6

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

707.6 Openings.
Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for *exit access stairways* and *ramps*, *interior exit stairways* and *ramps* and *exit passageways* shall also comply with Sections 1019, 1023.4 and 1024.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door* serving enclosures for*exit access stairways* and *ramps,* and*interior exit stairways* and *ramps.*
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.
4. *Fire window assemblies* permitted in *atrium* separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a *fire door assembly* in a *fire barrier* separating an enclosure for *exit access stairways* and *ramps*, and *interior exit stairways* and *ramps* from an *exit passageway* in accordance with Section 1023.3.1.
6. Openings providing entrance to an elevator car shall not be limited to 156 square feet (15 m2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier that is an elevator hoistway enclosure.

BCAC Egress Item 6 corridor continuity Proposal 2 lobby walls (6874)

IBC: SECTION 708, 708.4.1 (New), SECTION 709, SECTION 710, 709.4.2, 710.4.1 (New), SECTION 3006, SECTION 3007, 3006.3, 3007.6.3, 3007.6.2, SECTION 3008, 3008.6.1, 3008.6.2, 3008.6.3, 3008.6.3.1, 3008.6.3.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

SECTION 708 FIRE PARTITIONS

Add new text as follows:

708.4.1 Fire partition walls enclosing elevator lobbies. Fire partition walls used to enclose elevator lobbies in accordance with Section 3006.3 (elevator hoistway protection), shall form an effective enclosure that terminates at a fire barrier or fire partition having a level of fire-resistance-rating not less than 1 hour, or an outside wall.

SECTION 709 SMOKE BARRIERS

SECTION 710 SMOKE PARTITIONS

Revise as follows:

709.4.2 Smoke-barrier walls enclosing areas of refuge or elevator lobbies. *Smoke-barrier* walls used to enclose *areas of refuge* in accordance with Section 1009.6.4, or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.6.2, or 3008.6.2, shall form an effective membrane enclosure that terminates at a *fire barrier* wall having a ~~level of~~ *fire ~~protection~~ resistance rating* not less than 1 hour, another *smoke barrier* wall or an outside wall. A smoke and draft control door assembly as specified in Section 716.2.2.1.1 shall not be required at each elevator hoistway door ~~opening~~ where protected by an elevator lobby, at each exit door opening into a protected lobby or at each exit doorway between an *area of refuge* and the exit enclosure.

Add new text as follows:

710.4.1 Smoke partition walls enclosing elevator lobbies. Smoke partition walls used to enclose elevator lobbies in accordance with Section 3006.3 (elevator hoistway protection), shall form an effective enclosure that terminates at a fire barrier having a level of fire-resistance-rating not less than 1 hour, another smoke partition or an outside wall.

Revise as follows:

SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY ~~OPENING~~ DOOR PROTECTION

SECTION 3007 FIRE SERVICE ACCESS ELEVATOR

Revise as follows:

3006.3 ~~Hoistway opening~~ Elevator hoistway door protection.
Where Section 3006.2 requires protection of the elevator hoistway ~~door opening~~ doors, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor ~~by~~ with *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the ~~elevator lobby enclosure walls~~ fire partitions shall comply with Section 716.2.2.1 ~~as required for *corridor* walls~~. Penetrations of the ~~enclosed elevator lobby~~ fire partitions by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway ~~*shaft enclosure*~~ doors from each floor ~~by~~ with *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the ~~enclosed elevator lobby~~ smoke partitions by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.

3. Additional doors shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such door shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.

4. The elevator hoistway shall be pressurized in accordance with Section 909.21.

3007.6.3 ~~Lobby~~ Elevator lobby doorways. Other than doors to ~~the hoistway,~~ elevator control room or elevator control space, each door ~~doorway to an enclosed fire service access elevator lobby~~ in the fire barrier shall be provided with a $^{3}/_{4}$-hour *fire door assembly* complying with Section 716. ~~The~~ Such *fire door assembly* shall comply with the smoke and draft control door assembly requirements of Section 716.2.2.1.1 and be tested in accordance with UL 1784 without an artificial bottom seal.

3007.6.2 Elevator lobby ~~Lobby~~ enclosure. The fire service access elevator lobby shall be ~~enclosed~~ separated from each floor with a *smoke barrier* in accordance with Section 709 ~~having a *fire-resistance rating* of not less than 1 hour~~, except that lobby doorways shall comply with Section 3007.6.3.

Exception: Enclosed fire service access elevator lobbies are not required at the *levels of exit discharge*.

SECTION 3008 OCCUPANT EVACUATION ELEVATORS

Revise as follows:

3008.6.1 Access to interior exit stairway or ramp.
The occupant evacuation elevator lobby shall have *direct access* from the enclosed elevator lobby to an *interior exit stairway or ramp*.

Exceptions:

1. Access to an *interior exit stairway or ramp* shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section ~~716.2.2.1~~ 716.2.2.1.1.
2. Elevators that only service an *open parking garage* and the elevator lobby of the building shall not be required to provide *direct access*.

3008.6.2 Elevator lobby ~~Lobby~~ enclosure. The occupant evacuation elevator lobby shall be ~~enclosed~~ separated from each floor with a *smoke barrier* in accordance with Section 709 ~~having a *fire-resistance rating* of not less than 1 hour~~, except that lobby doorways shall comply with Section 3008.6.3.

Exception: Enclosed occupant evacuation elevator lobbies are not required at the *levels of exit discharge*.

3008.6.3 Elevator lobby ~~Lobby~~ doorways. Other than the doors to ~~the hoistway,~~ elevator machine rooms, machinery spaces, control rooms and control spaces ~~within the lobby enclosure~~ in the *smoke barrier*, each doorway to an occupant evacuation elevator lobby shall be provided with a $^{3}/_{4}$-hour *fire door assembly* complying with Section 716. ~~The~~ Such *fire door assembly* shall comply with the smoke and draft control assembly requirements of Section 716.2.2.1.1 and be tested in accordance with UL 1784 without an artificial bottom seal.

3008.6.3.1 Vision panel. A vision panel shall be installed in each *fire door assembly* ~~protecting the lobby doorway~~ in the smoke barrier. The vision panel shall consist of fire-protection-rated glazing, shall comply with the requirements of Section 716 and shall be located to furnish clear vision of the occupant evacuation elevator lobby.

3008.6.3.2 Door closing. Each *fire door assembly* ~~protecting the lobby doorway~~ in the smoke barrier shall be automatic-closing upon receipt of any fire alarm signal from the *emergency voice/alarm communication system* serving the building.

BCAC Egress Item 6 corridor continuity Proposal 5 exception for low rise (6970)

IBC: 716.2.2.1, 1020.2.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

716.2.2.1 Door assemblies in corridors and smoke barriers.
Fire door assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.1(2) shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.
5. In corridor walls required to have a fire-resistance rating in accordance with Section 1020.2, an elevator hoistway door opening directly into the corridor is not required to meet the smoke and draft control door assembly requirements in this section where the elevator connect 3 stories or less and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

1020.2.1 Hoistway ~~opening~~ protection. Elevator hoistway doors in elevators hoistway enclosures required to be fire resistance rated shall be protected in accordance with Section 716. Elevator hoistway doors ~~openings~~ shall also be protected in accordance with Section ~~3006.2.1~~ 3006.2.

Reason Statement: The intent of this proposal is consistent terminology for elevator protection. The current text is very inconsistent. This is not intended to have any technical changes.
The elevator industry considers an elevator hoistway the vertical movement of that device, whether it be in a rated enclosure, in non-rated enclosure, or not enclosed at all. The photos are examples of hoistways that are the non-rated enclosure and the open hoistway.

Example of elevator hoistways that are not in rated enclosures.

The intent of this proposal is consistent terminology for elevator protection. The current text is very inconsistent. This is not intended to have any technical changes.The elevator industry considers an elevator hoistway the vertical movement of that device, whether it be in a rated enclosure, in non-rated enclosure, or not enclosed at all. The photos are examples of hoistways that are the non-rated enclosure and the open hoistway.

Examples of doors or other devices in front of associated elevator entrance doors – see Section 3002.6 and 3006.3 Item 3

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC Fire Code Action Committee (FCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of the terminology for elevator hoistways, and shaft protection and the associated elevator doors and has no changes to the construction.

BCAC General Item 12 -Podium separation (6304)

IBC: 510.2, 707.3.11 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

510.2 Horizontal building separation allowance.
A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where ~~vertical offsets are provided as part of~~ a *horizontal assembly* contains vertical offsets , the vertical offset ~~and the structure supporting the vertical offset~~ shall be constructed as a fire barrier in accordance with Section 707 and shall have a *fire-resistance rating* of not less than 3 hours.
2. The building below, including the *horizontal assembly* and any associated vertical offsets, is of Type IA construction.
3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided that the following conditions are met:

   1. The building above the *horizontal assembly* is not required to be of Type I construction.
   2. The enclosure connects fewer than four stories.
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

4. *Interior exit stairways* located within the Type IA building are permitted to be of combustible materials where the following requirements are met:

   4.1. The building above the Type IA building is of Type III, IV, or V construction.

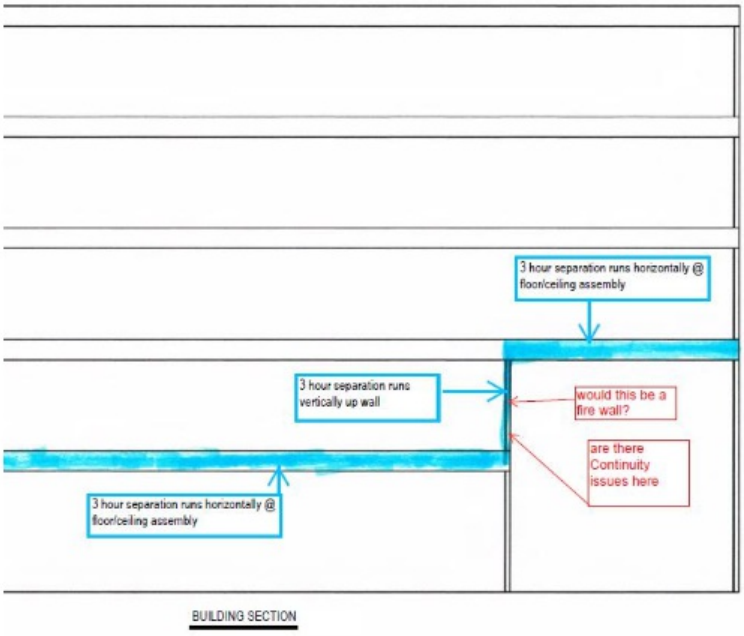
   4.2. The *stairway*located in the Type IA building is enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less 300, or Group B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.
7, The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

Add new text as follows:

707.3.11 Horizontal separation offsets. The fire-resistance rating of a fire barrier serving as the vertical offset in a horizontal building separation shall comply with Section 510.2.

Reason Statement: The code provides for the allowance of vertical offsets in horizontal building separations, but does not clarify how the separation must be constructed other than to also be 3-hour rated. This code proposal fills in the gap so that users know what type of assembly must be used, fire barriers, and subsequently how to address openings, penetrations, joints, continuity, etc. This also clarifies that the vertical offset must also be Type 1A construction just like the horizontal assembly does.



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

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only provides clear direction as to how the vertical offset must be constructed, in the manner that it likely commonly is.

BCAC General Item 12 -Podium separation (6304)

BCAC General Item8-Mandatory language "May" (7016)

IBC: TABLE 721.1(2), FIGURE 722.5.1(2); IFC: 5704.2.9.7.5.1, TABLE 6109.12; IZC: 302.1, 305.1, 1008.1.1, 1004.4, 1008.2.4, 1008.2.6, 1009.2, 1301.1, 1302.2

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

TABLE 721.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS [a, o, p]

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE[b] (inches)			
			4 hours	3 hours	2 hours	1 hour
1. Brick of clay or shale	1-1.1	Solid brick of clay or shale.[c]	6	4.9	3.8	2.7
	1-1.2	Hollow brick, not filled.	5.0	4.3	3.4	2.3
	1-1.3	Hollow brick unit wall, grout or filled with perlite vermiculite or expanded shale aggregate.	6.6	5.5	4.4	3.0
	1-2.1	4" nominal thick units not less than 75 percent solid backed with a hat-shaped metal furring channel $^3/_4$" thick formed from 0.021" sheet metal attached to the brick wall on 24" centers with approved fasteners, and $^1/_2$" Type X gypsum wallboard attached to the metal furring strips with 1"-long Type S screws spaced 8" on center.	—	—	5[d]	—
2. Combination of clay brick and load-bearing hollow clay tile	2-1.1	4" solid brick and 4" tile (not less than 40 percent solid).	—	8	—	—
	2-1.2	4" solid brick and 8" tile (not less than 40 percent solid).	12	—	—	—
3. Concrete masonry units	3-1.1[f, g]	Expanded slag or pumice.	4.7	4.0	3.2	2.1
	3-1.2[f, g]	Expanded clay, shale or slate.	5.1	4.4	3.6	2.6
	3-1.3[f]	Limestone, cinders or air-cooled slag.	5.9	5.0	4.0	2.7
	3-1.4[f, g]	Calcareous or siliceous gravel.	6.2	5.3	4.2	2.8
4. Solid concrete[h, i]	4-1.1	Siliceous aggregate concrete.	7.0	6.2	5.0	3.5
		Carbonate aggregate concrete.	6.6	5.7	4.6	3.2
		Sand-lightweight concrete.	5.4	4.6	3.8	2.7
		Lightweight concrete.	5.1	4.4	3.6	2.5
5. Glazed or unglazed facing tile, nonload-bearing	5-1.1	One 2" unit cored 15 percent maximum and one 4" unit cored 25 percent maximum with $^3/_4$" mortar-filled collar joint. Unit positions reversed in alternate courses.	—	$6^3/_8$	—	—
	5-1.2	One 2" unit cored 15 percent maximum and one 4" unit cored 40 percent maximum with $^3/_4$" mortar-filled collar joint. Unit positions side with $^3/_4$" gypsum plaster. Two wythes tied together every fourth course with No. 22 gage corrugated metal ties.	—	$6^3/_4$	—	—
	5-1.3	One unit with three cells in wall thickness, cored 29 percent maximum.	—	—	6	—
	5-1.4	One 2" unit cored 22 percent maximum and one 4" unit cored 41 percent maximum with $^1/_4$" mortar-filled collar joint. Two wythes tied together every third course with 0.030"(No. 22 galvanized sheet steel gage) corrugated metal ties.	—	—	6	—
	5-1.5	One 4" unit cored 25 percent maximum with $^3/_4$" gypsum plaster on one side.	—	—	$4^3/_4$	—
	5-1.6	One 4" unit with two cells in wall thickness, cored 22 percent maximum.	—	—	—	4
	5-1.7	One 4" unit cored 30 percent maximum with $^3/_4$" vermiculite gypsum plaster on one side.	—	—	$4^1/_2$	—
	5-1.8	One 4" unit cored 39 percent maximum with $^3/_4$" gypsum plaster on one side.	—	—	—	$4^1/_2$
		$^3/_4$" by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with 2.6-pound flat metal lath				

6. Solid gypsum plaster	6-1.1	applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
	6-1.2	$^3/_4$" by 0.05" (No. 16 carbon sheet steel gage) cold-rolled channels 16" on center with metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Perlite or vermiculite gypsum plaster each side. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate for the 1-hour system.	—	—	$2^1/_2$[d]	2[d]
	6-1.3	$^3/_4$" by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with $^3/_8$" gypsum lath applied to one face and attached with sheet metal clips. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
	6-2.1	Studless with $^1/_2$" full-length plain gypsum lath and gypsum plaster each side. Plaster mixed 1:1 for scratch coat and 1:2 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	2[d]
	6-2.2	Studless with $^1/_2$" full-length plain gypsum lath and perlite or vermiculite gypsum plaster each side.	—	—	$2^1/_2$[d]	2[d]
	6-2.3	Studless partition with $^3/_8$" rib metal lath installed vertically adjacent edges tied 6" on center with No. 18 gage wire ties, gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2[d]
7. Solid perlite and Portland cement	7-1.1	Perlite mixed in the ratio of 3 cubic feet to 100 pounds of Portland cement and machine applied to stud side of $1^1/_2$" mesh by 0.058-inch (No. 17 B.W. gage) paper-backed woven wire fabric lath wire-tied to 4"-deep steel trussed wire[j] studs 16" on center. Wire ties of 0.049" (No. 18 B.W. gage) galvanized steel wire 6" on center vertically.	—	—	$3^1/_8$[d]	—
8. Solid neat wood fibered gypsum plaster	8-1.1	$^3/_4$" by 0.055-inch (No. 16 carbon sheet steel gage) cold-rolled channels, 12" on center with 2.5-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W.gage) wire at 6" spacing. Neat gypsum plaster applied each side.	—	—	2[d]	—
9. Solid wallboard partition	9-1.1	One full-length layer $^1/_2$" Type X gypsum wallboard[e] laminated to each side of 1" full-length V-edge gypsum coreboard with approved laminating compound. Vertical joints of face layer and coreboard staggered not less than 3".	—	—	2[d]	—
10. Hollow (studless) gypsum wallboard partition	10-1.1	One full-length layer of $^5/_8$" Type X gypsum wallboard[e] attached to both sides of wood or metal top and bottom runners laminated to each side of 1" × 6" full-length gypsum coreboard ribs spaced 2" on center with approved laminating compound. Ribs centered at vertical joints of face plies and joints staggered 24" in opposing faces. Ribs ~~may~~ shall be permitted to be recessed 6" from the top and bottom.	—	—	—	$2^1/_4$[d]
	10-1.2	1" regular gypsum V-edge full-length backing board attached to both sides of wood or metal top and bottom runners with nails or $1^5/_8$" drywall screws at 24" on center. Minimum width of runners $1^5/_8$". Face layer of $^1/_2$" regular full-length gypsum wallboard laminated to outer faces of backing board with approved laminating compound.	—	—	$4^5/_8$[d]	—
11. Noncombustible studs—interior	11-1.1	$3^1/_4$" × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 24" on center. $^5/_8$" gypsum plaster on metal lath each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	$4^3/_4$[d]
	11-1.2	$3^3/_8$" × 0.055" (No. 16 carbon sheet steel gage) approved nailable[k] studs spaced 24" on center. $^5/_8$" neat gypsum wood-fibered plaster each side over $^3/_8$" rib metal lath nailed to studs with 6d common nails, 8" on center. Nails driven $1^1/_4$" and bent over.	—	—	$5^5/_8$	—
		4" × 0.044" (No. 18 carbon sheet steel gage) channel-shaped steel studs at 16" on center. On each side approved resilient				

partition with plaster each side	11-1.3	steel studs at 16" on center. On each side approved resilient clips pressed onto stud flange at 16" vertical spacing, $^1/_4$" pencil rods snapped into or wire tied onto outer loop of clips, metal lath wire-tied to pencil rods at 6" intervals, 1" perlite gypsum plaster, each side.	—	$7^5/_8$[d]	—	—
	11-1.4	$2^1/_2$" × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 16" on center. Wood fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied on $^3/_4$-pound metal lath wire tied to studs, each side. $^3/_4$" plaster applied over each face, including finish coat.	—	—	$4^1/_4$[d]	—
12. Wood studs—interior partition with plaster each side	12-1.1[l, m]	2" × 4" wood studs 16" on center with $^5/_8$" gypsum plaster on metal lath. Lath attached by 4d common nails bent over or No. 14 gage by $1^1/_4$" by $^3/_4$" crown width staples spaced 6" on center. Plaster mixed 1:$1^1/_2$ for scratch coat and 1:3 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	$5^1/_8$
	12-1.2[l]	2" × 4" wood studs 16" on center with metal lath and $^7/_8$" neat wood-fibered gypsum plaster each side. Lath attached by 6d common nails, 7" on center. Nails driven $1^1/_4$" and bent over.	—	—	$5^1/_2$[d]	—
	12-1.3[l]	2" × 4" wood studs 16" on center with $^3/_8$" perforated or plain gypsum lath and $^1/_2$" gypsum plaster each side. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard blued nails, 4" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	$5^1/_4$
	12-1.4[l]	2" × 4" wood studs 16" on center with $^3/_8$" Type X gypsum lath and $^1/_2$" gypsum plaster each side. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard blued nails, 5" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	$5^1/_4$
13. Noncombustible studs—interior partition with gypsum wallboard each side	13-1.1	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 24" on center with one full-length layer of $^5/_8$" Type X gypsum wallboard[e] applied vertically attached with 1"-long No. 6 dry wall screws to each stud. Screws are 8" on center around the perimeter and 12" on center on the intermediate stud. Where applied horizontally, the Type X gypsum wallboard shall be attached to $3^5/_8$" studs and the horizontal joints shall be staggered with those on the opposite side. Screws for the horizontal application shall be 8" on center at vertical edges and 12" on center at intermediate studs.	—	—	—	$2^7/_8$[d]
	13-1.2	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 25" on center with two full-length layers of $^1/_2$" Type X gypsum wallboard[e] applied vertically each side. First layer attached with 1"-long, No. 6 drywall screws, 8" on center around the perimeter and 12" on center on the intermediate stud. Second layer applied with vertical joints offset one stud space from first layer using $1^5/_8$" long, No. 6 drywall screws spaced 9" on center along vertical joints, 12" on center at intermediate studs and 24" on center along top and bottom runners.	—	—	$3^5/_8$[d]	—
	13-1.3	0.055" (No. 16 carbon sheet steel gage) approved nailable metal studs[e] 24" on center with full-length $^5/_8$" Type X gypsum wallboard[e] applied vertically and nailed 7" on center with 6d cement-coated common nails. Approved metal fastener grips used with nails at vertical butt joints along studs.	—	—	—	$4^7/_8$
	14-1.1[h, m]	2" × 4" wood studs 16" on center with two layers of $^3/_8$" regular gypsum wallboard[e] each side, 4d cooler[n] or wallboard[n] nails at 8" on center first layer, 5d cooler[n] or wallboard[n] nails at 8" on center second layer with laminating compound between layers, joints staggered. First layer applied full length vertically, second layer applied horizontally or vertically.	—	—	—	5
	14-1.2[l, m]	2" × 4" wood studs 16" on center with two layers $^1/_2$" regular gypsum wallboard[e] applied vertically or horizontally each side[k], joints staggered. Nail base layer with 5d cooler[n] or wallboard[n]	—	—	—	$5^1/_2$

		nails at 8" on center face layer with 8d cooler[n] or wallboard[n] nails at 8" on center.				
14. Wood studs—interior partition with gypsum wallboard each side	14-1.3[l, m]	2" × 4" wood studs 24" on center with $^5/_8$" Type X gypsum wallboard[e] applied vertically or horizontally nailed with 6d cooler[n] or wallboard[n] nails at 7" on center with end joints on nailing members. Stagger joints each side.	—	—	—	$4^3/_4$
	14-1.4[l]	2" × 4" fire-retardant-treated wood studs spaced 24" on center with one layer of $^5/_8$" Type X gypsum wallboard[e] applied with face paper grain (long dimension) parallel to studs. Wallboard attached with 6d cooler[n] or wallboard[n] nails at 7" on center.	—	—	—	$4^3/_4$[d]
	14-1.5[l, m]	2" × 4" wood studs 16" on center with two layers $^5/_8$" Type X gypsum wallboard[e] each side. Base layers applied vertically and nailed with 6d cooler[n] or wallboard[n] nails at 9" on center. Face layer applied vertically or horizontally and nailed with 8d cooler[n] or wallboard[n] nails at 7" on center. For nail-adhesive application, base layers are nailed 6" on center. Face layers applied with coating of approved wallboard adhesive and nailed 12" on center.	—	—	6	—
	14-1.6[l]	2" × 3" fire-retardant-treated wood studs spaced 24" on center with one layer of $^5/_8$" Type X gypsum wallboard[e] applied with face paper grain (long dimension) at right angles to studs. Wallboard attached with 6d cement-coated box nails spaced 7" on center.	—	—	—	$3^5/_8$[d]
	15-1.1[l, m]	Exterior surface with $^3/_4$" drop siding over $^1/_2$" gypsum sheathing on 2" × 4" wood studs at 16" on center, interior surface treatment as required for 1-hour-rated exterior or interior 2" × 4" wood stud partitions. Gypsum sheathing nailed with $1^3/_4$" by No.11 gage by $^7/_{16}$" head galvanized nails at 8" on center. Siding nailed with 7d galvanized smooth box nails.	—	—	—	Varies
	15-1.2[l, m]	2" × 4" wood studs 16" on center with metal lath and $^3/_4$" cement plaster on each side. Lath attached with 6d common nails 7" on center driven to 1" minimum penetration and bent over. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	$5^3/_8$
	15-1.3[l, m]	2" × 4" wood studs 16" on center with $^7/_8$" cement plaster (measured from the face of studs) on the exterior surface with interior surface treatment as required for interior wood stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies
	15-1.4	$3^5/_8$" No. 16 gage noncombustible studs 16" on center with $^7/_8$" cement plaster (measured from the face of the studs) on the exterior surface with interior surface treatment as required for interior, nonbearing, noncombustible stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies[d]
	15-1.5[m]	$2^1/_4$" × $3^3/_4$" clay face brick with cored holes over $^1/_2$" gypsum sheathing on exterior surface of 2" × 4" wood studs at 16" on center and two layers $^5/_8$" Type X gypsum wallboard[e] on interior surface. Sheathing placed horizontally or vertically with vertical joints over studs nailed 6" on center with $1^3/_4$" × No. 11 gage by $^7/_{16}$" head galvanized nails. Inner layer of wallboard placed horizontally or vertically and nailed 8" on center with 6d cooler[n] or wallboard[n] nails. Outer layer of wallboard placed horizontally or vertically and nailed 8" on center with 8d cooler[n] or wallboard[n] nails. Joints staggered with vertical joints over studs. Outer layer joints taped and finished with compound. Nail heads covered with joint compound. 0.035 inch (No. 20 galvanized sheet gage) corrugated galvanized steel wall ties $^3/_4$" by $6^5/_8$" attached to each stud with two 8d cooler[n] or wallboard[n] nails every sixth course of bricks.	—	—	10	—

	every sixth course of bricks.				
15-1.6[l, m]	2" × 6" fire-retardant-treated wood studs 16" on center. Interior face has two layers of $^5/_8$" Type X gypsum with the base layer placed vertically and attached with 6d box nails 12"on center. The face layer is placed horizontally and attached with 8d box nails 8" on center at joints and 12" on center elsewhere. The exterior face has a base layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by self-furred exterior lath attached with $2^1/_2$", No. 12 gage galvanized roofing nails with a $^3/_8$" diameter head and spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" brown coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat.	—	—	$8^1/_4$	—
15-1.7[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1" by No. 18 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat, a bonding agent and a $^1/_2$" brown coat and a finish coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of 0.035 inch (No. 20 B.W. gage) woven wire lath furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No. 12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.	—	—	$8^3/_8$	—
15-1.8[l, m]	2" × 6" wood studs 16" on center. The exterior face has a layer of $^5/_8$" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by $1^1/_2$" by No. 17 gage self-furred exterior lath attached with 8d by $2^1/_2$"-long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $^1/_2$" scratch coat and a $^1/_2$" brown coat is then applied. The plaster ~~may~~ shall be permitted to be placed by machine. The scratch coat is mixed in the proportion of 1:4 by weight, plastic cement to sand. The brown coat is mixed in the proportion of 1:5 by weight, plastic cement to sand. The interior is covered with $^3/_8$" gypsum lath with 1" hexagonal mesh of No. 20-gage woven wire lath furred out $^5/_{16}$" and 1" perlite or vermiculite gypsum plaster. Lath nailed with $1^1/_8$" by No. 13 gage by $^{19}/_{64}$" head plasterboard glued nails spaced 5" on center. Mesh attached by $1^3/_4$" by No.12 gage by $^3/_8$" head nails with $^3/_8$" furrings, spaced 8" on center. The plaster mix shallnot exceed 100 pounds of gypsum to $2^1/_2$ cubic feet of aggregate.	—	—	$8^3/_8$	—
	4" No. 18 gage, nonload-bearing metal studs, 16" on center, with 1" Portland cement lime plaster (measured from the back side				

15. Exterior or interior walls	15-1.9	of the $^3/_4$-pound expanded metal lath) on the exterior surface. Interior surface to be covered with 1" of gypsum plaster on $^3/_4$-pound expanded metal lath proportioned by weight—1:2 for scratch coat, 1:3 for brown, gypsum to sand. Lath on one side of the partition fastened to $^1/_4$" diameter pencil rods supported by No. 20 gage metal clips, located 16" on center vertically, on each stud. 3" thick mineral fiber insulating batts friction fitted between the studs.	—	—	$6^1/_2$[d]	—
	15-1.10	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have two layers of $^1/_2$" Type X gypsum wallboard.[e] The first layer of wallboard to be attached with 1"-long Type S buglehead screws spaced 24" on center and the second layer is attached with $1^5/_8$"-long Type S screws spaced at 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	$6^1/_2$	—
	15-1.11	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, respectively, with $^1/_2$" glass fiber-reinforced concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $^1/_2$"-long flare-bevel welds, and 4" foot attached to the GFRC skin with $^5/_8$"-thick GFRC bonding pads that extend $2^1/_2$" beyond the flex anchor foot on both sides. Interior surface to have one layerof $^5/_8$" Type X gypsum wallboard[e], attached with $1^1/_4$"-long Type S buglehead screws spaced 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has $1^1/_2$" returns packed with mineral fiber and caulked on the exterior.	—	—	—	$6^1/_8$
	15-1.12[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $5^1/_2$" mineral wool insulation.	—	—	—	$6^3/_4$
	15-1.13[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. R-19 mineral fiber insulation installed in stud cavity.	—	—	—	$6^3/_4$
	15-1.14[q]	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 7" on center.	—	—	—	$6^3/_4$
	15-1.15[q]	2" × 4" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $^5/_8$" Type X gypsum wallboard and sheathing, respectively, 4′ wide, applied horizontally or vertically with vertical joints over studs, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center. Cavity to be filled with $3^1/_2$" mineral wool insulation.	—	—	—	$4^3/_4$
	15-1.16[q]	2" × 6" wood studs at 24" centers with double top plates, single bottom plate; interior and exterior side covered with two layers of $^5/_8$" Type X gypsum wallboard, 4′ wide, applied horizontally with vertical joints over studs. Base layer fastened with $2^1/_4$" Type S drywall screws, spaced 24" on center and face layer fastened with Type S drywall screws, spaced 8" on center	—	—	8	—

		fastened with Type S drywall screws, spaced 8" on center; wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with $5^1/_2$" mineral wool insulation.				
	15-2.1[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than $1^3/_4$". Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.	—	—	—	6
	15-2.2[d]	$3^5/_8$" No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $^3/_4$" thick Portland cement plaster. Thin veneer brick units of clay or shale complying with C1157/C1157M—2017, Grade TBS or better, installed in running bond in accordance with Section 1404.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than 2". Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$6^7/_8$	—
	15-2.3[d]	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with one layer of $^5/_8$"-thick Type X gypsum wallboard attached to studs with 1"-long No. 6 drywall screws at 12" on center.	—	—	—	$7^7/_8$
	15-2.4[d]	$3^5/_8$" No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1"-long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than $2^5/_8$" thick complying with C270—14a installed in accordance with Section 1404.6 with a minimum 1" airspace. Interior side covered with two layers of $^5/_8$"-thick Type X gypsum wallboard. Bottom layer attached to studs with 1"-long No. 6 drywall screws at 24" on center. Top layer attached to studs with $1^5/_8$"-long No. 6 drywall screws at 12" on center.	—	—	$8^1/_2$	—
16. Exterior	16-1.1[q]	2" × 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically, horizontal joints blocked and fastened with 6d common nails (bright)—12" on center in the field, and 6" on center panel edges. Cavity to be filled with $3^1/_2$" mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	$4^1/_2$
		2" × 6" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with $^5/_8$" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical				

walls rated for fire resistance from the inside only in accordance with Section 705.5.	16-1.2[q]	wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs and fastened with $2^1/_4$" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with $^7/_{16}$" wood structural panels fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with $5^1/_2$" mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	$6^9/_{16}$
	16-1.3[q]	2" × 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with $^5/_8$" Type X gypsum wallboard, 4'wide, applied vertically with all joints over framing or blocking and fastened with $2^1/_4$" Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with $^3/_8$" wood structural panels, applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 mineral fiber insulation installed in stud cavity. Rating established from the gypsum-covered side only.	—	—	—	$6^1/_2$

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness shall include the thickness of applied plaster and lath or gypsum wallboard, where specified.

c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is not less than 75 percent of the gross cross-sectional area measured in the same plane.

d. Shall be used for nonbearing purposes only.

e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with not less than $^1/_{16}$-inch gypsum veneer plaster.

f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than $7^5/_8$ inches is 4 hours where cores that are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of $^3/_8$ inch.

g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

h. See Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.

i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.

j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.

k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.

l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided that the length of the fasteners used to attach the fire protection is increased by an amount not less than the thickness of the wood structural panel.

m. For studs with a slenderness ratio, l_e/d, greater than 33, the design stress shall be reduced to 78 percent of allowable F'_c. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F'_c calculated for studs having a slenderness ratio l_e/d of 33.

n. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein specified.

p. NCMA TEK 5-8A shall be permitted for the design of fire walls.

q. The design stress of studs shall be equal to not more than 100 percent of the allowable F'_c calculated in accordance with Section 2306.

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. Type X gypsum board or gypsum panel products in accordance with ASTM C1177, C1178, C1278, C1396 or C1658. The total thickness of gypsum board or gypsum panel products calculated as *h* in Section 722.5.1.2 shall be applied vertically to an individual column using one of the following methods:

    1. As a single layer without horizontal joints.
    2. As multiple layers with horizontal joints not permitted in any layer.
    3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer. The total required thickness of gypsum board or gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of gypsum board or gypsum panel product ~~may~~ shall be permitted to be applied to the exterior of the sheet steel column covers with 1-inch long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with $1^1/_2$-inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.

3. For fire-resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239-inch minimum thickness galvanized or stainless steel. For 4-hour fire-resistance ratings, the column covers shall be fabricated from 0.0239-inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details. For fire-resistance ratings of 2 hours or less, column covers fabricated from 0.0269-inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with $^1/_2$-inch-long No. 8 sheet metal screws spaced 12 inches on center. The column covers shall be provided with a minimum expansion clearance of $^1/_8$ inch per linear foot between the ends of the cover and any restraining construction.

FIGURE 722.5.1(2)
GYPSUM-PROTECTED STRUCTURAL STEEL COLUMNS WITH SHEET STEEL COLUMN COVERS

2021 International Fire Code

Revise as follows:

5704.2.9.7.5.1 Information signs. A permanent sign shall be provided at the fill point for the tank, documenting the filling procedure and the tank calibration chart.

Exception:
Where climatic conditions are such that the sign ~~may be~~ has the potential to be obscured by ice or snow, or weathered beyond readability or otherwise impaired, said procedures and chart shall be located in the office window, lock box or other area available to the person filling the tank.

TABLE 6109.12
SEPARATION FROM EXPOSURES OF LP-GAS CONTAINERS AWAITING USE, RESALE OR EXCHANGE STORED OUTSIDE OF BUILDINGS

QUANTITY OF LP-GAS STORED (pounds)	MINIMUM SEPARATION DISTANCE FROM STORED LP-GAS CYLINDERS TO (feet):						
	Nearest important building or group of buildings or line of adjoining property that may be built on	Line of adjoining property occupied by schools, places of religious worship, hospitals, athletic fields or other points of public gathering; busy thoroughfares; or sidewalks	LP-gas dispensing station	Doorway or opening to a building with two or more means of egress	Doorway or opening to a building with one means of egress	Combustible materials	Motor vehicle fuel dispenser
720 or less	0	0	5	5	10	10	20
721–2,500	0	10	10	5	10	10	20
2,501–6,000	10	10	10	10	10	10	20
6,001–10,000	20	20	20	20	20	10	20
Over 10,000	25	25	25	25	25	10	20

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.

2021 International Zoning Code

Revise as follows:

302.1 Minimum areas. The minimum areas that ~~may~~ constitute a separate or detached part of any of the following zoning districts on the zoning map or subsequent amendments to said zoning map shall be as shown in Table 302.1. Where a nonresidential district is directly across the street from or abuts the district with the same or less restrictive classification, the area of the land directly across the street or abutting the property ~~may~~ shall be permitted to be included in the calculations in meeting the minimum district size requirements.

305.1 General. The principal objective of this zoning code is to provide for an orderly arrangement of compatible buildings and land uses, and for the property location of all types of uses required for the social and economic welfare of the community. To accomplish this objective, each type and kind of use is classified as permitted in one or more of the various use districts established by this code. However, in addition to those uses specifically classified and permitted in each district, there are certain additional uses that it ~~may be~~ is necessary to allow because of the unusual characteristics of the service they provide the public. These *conditional uses* require particular considerations as to their proper location to adjacent, established or intended uses, or to the planned growth of the community. The conditions controlling the locations and operation of such special uses are established by the applicable sections of this code.

1008.1.1 Wall signs. Every single-family residence, multiple-family residential complex, commercial or *industrial* building, and every separate nonresidential building in a residential zone ~~may~~ shall be permitted to display wall signs per street frontage subject to the limiting standards set forth in Table 1008.1.1(1). For shopping centers, planned *industrial parks* or other multiple-occupancy nonresidential buildings, the building face or wall shall be calculated separately for each separate occupancy, but in no event will the allowed area for any separate occupancy be less than [JURISDICTION TO INSERT NUMBER] square feet.

1004.4 Traffic visibility. Signs or sign structures shall not be erected at the intersection of any street in such a manner as to obstruct free and clear vision, nor at any location where by its position, shape or color it ~~may interfere~~ interferes with or obstruct the view of or be confused with any authorized traffic sign, signal or device.

1008.2.4 Special event signs in public ways. Signs advertising a special community event shall not be prohibited in or over public rights-of-way, subject to approval by the code official as to the size, location and method of erection. The code official ~~may~~ shall be permitted to not approve any special event signage that would impair the safety and convenience of use of public rights-of-way, or obstruct traffic visibility.

1008.2.6 Political signs. Political signs shall be permitted in all zoning districts, subject to the following limitations:

1. Such signs shall not exceed a height of [JURISDICTION TO INSERT NUMBER] feet nor an area of [JURISDICTION TO INSERT NUMBER] square feet.

2. Such signs for election candidates or ballot propositions shall be displayed only for a period of 60 days preceding the election and shall be removed within 10 days after the election, provided that signs promoting successful candidates or ballot propositions in a primary election ~~may~~ shall be permitted to remain displayed until not more than 10 days after the general election.
3. Such signs shall not be placed in any public right-of-way or obstruct traffic visibility.

1009.2 Development complex sign. In addition to the freestanding business identification signs otherwise allowed by this ordinance, every multiple-occupancy development complex shall be entitled to one free-standing sign per street front, at the maximum size permitted for business identification free-standing signs, to identify the development complex. Business identification shall not be permitted on a development complex sign. Any free-standing sign otherwise permitted under this ordinance ~~may~~ shall identify the name of the development complex.

1301.1 Approval. *Planned unit developments* (PUDs) shall be allowed by planning commission approval in any zoning district. Such *planned unit development* permit shall not be granted unless such development will meet the use limitations of the zoning district in which it is located and meet the *density* and other limitations of such districts, except as such requirements ~~may~~ shall be lawfully modified as provided by this code. Compliance with the regulations of this code in no way excuses the developer from the applicable requirements of a subdivision ordinance, except as modifications thereof are specifically authorized in the approval of the application for the planned unit development.

1302.2 Uses. A*planned unit development* that will contain uses not permitted in the zoning district in which it is to be located will require a change of zoning district and shall be accompanied by an application for a zoning amendment, except that any residential use shall be considered to be a permitted use in a *planned unit development*, which allows residential uses and shall be governed by *density*, design and other requirements of the *planned unit development* permit.

Where a site is situated in more than one use district, the permitted uses applicable to such property in one district ~~may~~ shall be permitted to be extended into the adjacent use district.

BCAC Occupancy Item 8 FCAC WG5.5-Special amusement buildings (6336)

IBC: TABLE 903.2.11.6; IFC: SECTION 202, 105.5.3, TABLE 903.2.11.6, 907.2.12

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement ~~buildings~~ areas
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the *International Fire Code*

2021 International Fire Code

Revise as follows:

SPECIAL AMUSEMENT ~~BUILDING~~ AREA. ~~A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.~~ A special amusement area is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that:

1. Makes the means of egress path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

105.5.3 ~~Amusement buildings~~ Special amusement areas. An operational permit is required to operate a special amusement ~~building~~ area.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

SECTION	SUBJECT
903.2.10.2	Mechanical-access enclosed parking garages
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement ~~buildings~~ areas
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1030.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.5	Existing Group I-2, Condition 2 occupancies
1103.5.5	Pyroxylin plastics
Table 1207.7, Table 1207.8, Table 1206.9, Table 1206.10	Stationary and mobile energy storage systems
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.1.5.2	Hydrogen motor fuel-dispensing area canopies
2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3210.1.1	Record storage over 12 feet
3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers

5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m^3.

907.2.12 Special amusement ~~buildings~~ areas. An automatic smoke detection system shall be provided in buildings with special amusement ~~buildings~~ areas in accordance with Sections 907.2.12.1 through 907.2.12.3.

Reason Statement: The term ‘may’ is subjective. The proposal is to bring the text into enforceable language by using the ICC preferred language.as often as possible. Similar proposals will be submitted for the Group B cycle for IRC, IECC and IEBC.
This is a joint proposal submitted by the ICC Building Code Action Committee (BCAC) and the ICC Fire Code Action Committee (FCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:
FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes are only changing verbiage.

BCAC Occupancy Item 8 FCAC WG5.5-Special amusement buildings (6336)

Condensing Unit Definition (6042)

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

CONDENSING UNIT. ~~A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.~~ A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more power-driven compressors, condensers, liquid receivers (where required) and factory-supplied accessories.

Reason Statement: Reason

There are two different definitions in the I-codes for “condensing unit”. The IECC definition does not identify the compressors as “power-driven”, whereas the IMC definition does. The proposed common definition for use in the I-codes is an amalgamation of the IECC and IMC definitions, which also correlate with the definition of this term in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.

For information purposes, the following are the other definitions:

From the

IECC: CONDENSING UNIT. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled, or water-cooled), condenser fans and motors(where used) and factory-supplied accessories.

From the IMC: CONDENSING UNIT. A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.

From ASHRAE 15: CONDENSING UNIT a combination of one or more power-driven compressors, condensers, liquid receivers (when required), and regularly furnished accessories. From UL 60335-2-40: CONDENSING UNIT factory-made assembly that includes one or more motor-compressors, CONDENSER in cooling mode and motor-driven fan, blower or pump to circulate the heat transfer fluid through the CONDENSER with associated operational controls in addition to the necessary wiring

A change in Group B will be needed for IECC

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Condensing Unit Definition (6042)

FCAC 1.1.2 714.5.1.2 Through Penetration Firestop T Rating (6744)

IBC: 714.5.1.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

714.5.1.2 Through-penetration firestop system.
Through penetrations shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an *F rating*/*T rating* of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a *T rating*.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a *horizontal assembly* do not require a *T rating*.
3. Floor penetrations of maximum 4-inch (102 mm) nominal diameter metal conduit or tubing penetrating directly into metal-enclosed electrical power switchgear do not require a *T rating*.

4. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter do not require a T rating. These penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92,900 mm^2).

FCAC 1.1.3 a Shutters for Vertical Openings (7002)

IBC: 712.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by approved shutters at every penetrated floor shall be permitted in accordance with ~~this section.~~ all of the following:

1. The ~~shutters~~ shutter shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours.
2. The shutter shall ~~be so constructed as to~~ close immediately upon the actuation of a smoke detector installed in accordance with Section ~~907.3.1 and~~907.3.
3. The shutter shall completely ~~shut~~ close off the ~~well~~ vertical opening.
4. Escalators shall cease operation when the shutter begins to close.
5. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) ~~and.~~
6. The shutter shall be equipped with a ~~sensitive~~ sensing leading edge to ~~arrest its progress~~ stop closure where in contact with any obstacle, and ~~to~~ continue ~~its progress on release therefrom~~ to close when the obstacle is cleared.

FCAC 1.1.3 b Listed Automatic Shutters (6989)

IBC: 712.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by *listed* or *approved* shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be installed in accordance with the manufacturer's instructions. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.

FCAC 1.1.4 a Protecting Voids Above Fire Barriers with Approved Materials (6994)

IBC: 707.9, 715.6 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall ~~be filled. An *approved* material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~comply with Section 715.

Add new text as follows:

715.6 Fire barrier/nonfire-resistance-rated roof assembly intersections. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material or system to retard the passage of fire and hot gases.

FCAC 1.1.4 b Protecting Voids Above Fire Barriers with Approved Materials or Tested System (7007)

IBC: SECTION 202 (New), SECTION 202, 707.9, 715.2, 715.6 (New), ASTM Chapter 35 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

CONTINUITY HEAD-OF-WALL JOINT SYSTEM. An assemblage of specific materials or products that are designed to resist the passage of fire through voids created at the intersection of fire barriers and the underside of nonfire-resistance-rated roof assemblies for a prescribed period of time.

Revise as follows:

[BF] F RATING. The time period that the *through-penetration firestop system,* ~~*or*~~ *perimeter fire containment system* or *continuity head-of-wall joint system* limits the spread of fire through the penetration or void.

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, or *continuity head-of-wall joint system* limits the maximum temperature rise to 325°F (~~163~~ 181°C) above its initial temperature through the penetration or void on the nonfire side ~~when tested in accordance with ASTM E814 or UL 1479~~.

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall ~~be filled. An *approved* material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases~~ comply with Section 715.

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems*, ~~or~~ systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections , and *continuity head-of-wall joint systems* shall also be installed in accordance with the listing criteria.

Add new text as follows:

715.6 Fire barriers/nonfire-resistance-rated roof assembly intersections. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material to retard the passage of fire and hot gases, or shall be protected by an approved continuity head-of-wall joint system tested in accordance with ASTM E2837 to provide an F rating/T rating for a time period not less than the required fire-resistance rating of the fire barrier in which it is installed.

Add new standard(s) as follows:

E2837-2013 (2017): Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies

FCAC 1.1.5 a 707.8 Joints and Fire Barriers (6926)

IBC: 707.8

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

707.8 Joints. *Joints* made in or between *fire barriers*, and *joints* made at the intersection of *fire barriers* with the underside of a fire-resistance-rated floor or roof sheathing, slab or deck above, and ~~the exterior vertical wall intersection~~ with other fire-resistance-rated wall assemblies ~~intersection~~ shall comply with Section 715.

FCAC 1.1.5 b 715.2 Perimeter Fire Containment System clean up (6929)

IBC: 715.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems* ~~or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections~~ and *perimeter fire containment systems* shall also be installed in accordance with the listing criteria.

FCAC 1.1.5 c &c Editorially Temp and Pressure Correction (6933)

IBC: SECTION 202, 714.5.4, 715.4.1, 715.8

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, limits the maximum temperature rise to 325°F (181~~163~~°C) above its initial temperature through the penetration on the nonfire side when tested in accordance with ASTM E814 or UL 1479.

714.5.4 Penetrations in smoke barriers.
Penetrations in *smoke barriers* shall be protected by an approved *through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch ~~(7.47 Pa)~~ of water (74.7 Pa) in both the ambient temperature and elevated temperature tests shall not exceed either of the following:

1. 5.0 cfm per square foot (0.025 m^3/ s × m^2) of penetration opening for each *through-penetration firestop system*.
2. A total cumulative leakage of 50 cfm (0.024 m^3/s) for any 100 square feet (9.3 m^2) of wall area, or floor area.

715.4.1 Fire test criteria. *Perimeter fire containment systems* shall be tested in accordance with the requirements of ASTM E2307.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an *approved* material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch ~~(0.254 mm)~~ of water ~~column~~ (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

715.8 Joints and voids in smoke barriers. *Fire-resistant joint systems* protecting *joints* in *smoke barriers*, and perimeter fire containment systems protecting voids at the intersection of a horizontal *smoke barrier* and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cubic feet per minute per linear foot (0.00775 m^3/s m) of joint at 0.30 inch ~~(74.7 Pa)~~ of water (74.7 Pa) for both the ambient temperature and elevated temperature tests.

FCAC 1.1.5 e 715.6 Ext Wall Clean up (6931)

IBC: 715.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

715.6 Exterior ~~curtain~~ wall/vertical fire barrier intersections. Voids created at the intersection of nonfire-resistance-rated exterior ~~curtain~~ wall assemblies and vertical *fire barriers* shall be filled with an approved material or system to retard the interior spread of fire and hot gases.

FCAC 1.1.6 Door Closers ICC 500 (7080)

IBC: 716.2.6.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

716.2.6.1 Door closing.
Fire doors shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.
3. Fire doors required solely for compliance with ICC 500 shall not be required to be self-closing or automatic-closing.

FCAC 1.1.8 Deletion of Calculation for Opening Protectives (7087)

IBC: 716.1.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

716.1.1 Alternative methods for determining fire protection ratings.
The application of any of the alternative methods specified in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C. The required *fire resistance* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. ~~Calculations performed in an *approved* manner.~~
3. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in NFPA 252, NFPA 257, UL 9, UL 10B or UL 10C.
4. Alternative protection methods as allowed by Section 104.11.

FCAC 1.2.1 Structural Fire Engineering (6181)

IBC: SECTION 723 (New), 723.1 (New)

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

SECTION 723 STRUCTURAL FIRE ENGINEERING

723.1 Performance-based structural fire design. Where the fire protection for the building structural system is designed using a performance-based method, the design shall be in accordance with ASCE/SEI 7 Appendix E

Reason Statement: This proposal provides consistency with the temperature rise criteria (T rating) between penetrations protected with tested and listed systems versus those protected with concrete, grout and mortar. The language in this proposal is identical to the wording used to protect these same penetrations using concrete, grout and mortar in Section 714.5.1, Exception 2.
The code is currently inconsistent in the application of temperature rise criteria for continuous metallic penetrants such as pipes and conduit penetrating fire separations. Penetrations protected with concrete, grout, or mortar are permitted without a T rating, but the same penetrations protected with tested and listed systems would require the T rating. There is no technical justification for such a distinction. If anything, the tested systems have been specifically evaluated and will reliably achieve the same or higher level of performance.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will decrease cost by expanding the exception and removing the need to insulate these penetrating items.

FCAC 1.2.1 Structural Fire Engineering (6181)

FCAC 1.4-2d IFC 317 Vegetative roofs (6145)

IFC: SECTION 317, 317.1, 317.2, 317.3, 317.2.1, 317.2.2, 317.4.3; IBC: [BF] 1505.10

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

SECTION 317 VEGETATIVE ~~LANDSCAPED~~ ROOFS

317.1 General. ~~Landscaped~~ Vegetative roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.16 of the International Building Code. Vegetative roofs shall be maintained in accordance with Sections 317.2 and 317.3.

~~**317.2 Landscaped roof size.** Landscaped roof areas shall not exceed 15,625 square feet (1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a *listed* Class A roof assembly tested in accordance with ASTM E108 or UL 790 shall be provided between adjacent landscaped roof areas.~~

~~**317.3 Rooftop structure and equipment clearance.** For all vegetative roofs abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E108 or 790—2004 shall be achieved for a minimum 6-foot-wide (1829 mm) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports and building service equipment.~~

~~**317.4**~~ **317.2 Vegetation.** Vegetation shall be maintained in accordance with Sections 317.2.1 and 317.2.2. ~~317.4.1 and 317.4.2.~~

~~**317.4.1**~~ **317.2.1 Irrigation.** Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

~~**317.4.2**~~ **317.2.2 Dead foliage.** Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.

~~**317.4.3 Maintenance plan.** The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a landscaped roof, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.~~

~~**317.5**~~ **317.3 Maintenance equipment.** Fueled equipment stored on roofs and used for the care and maintenance of

vegetation on roofs shall be stored in accordance with Section 313.

2021 International Building Code

Revise as follows:

[BF] 1505.10 Landscaped and Vegetative roofs. Landscaped and vegetative roofs shall comply with Sections 1505.1 and 1507.15. Vegetative roofs ~~and~~ shall be installed in accordance with ANSI/SPRI VF-1.

Reason Statement: The term “landscaped roofs” has been used by the public to mean the same as “vegetative roofs” but it is used with a different meaning in ICC codes.The IBC defines vegetative roofs as follows:
VEGETATIVE ROOF. An assembly of interacting components designed to waterproof a building’s top surface that includes, by design, vegetation and related landscape elements.

This means that vegetative roof is a term that refers specifically to roof systems that are part of the building envelope. Moreover, it is clear Section 317 really should refer to “vegetative roofs” because they really address roofs that are part of the building envelope and, thus, are associated with the existing definition of “vegetative roofs”. Therefore, the term “landscaped roofs” is unnecessary and should be replaced by the defined term “vegetative roofs” in this section.
Moreover, the language in the IFC in the set of sections 317, which applies to “vegetative roofs”, needs to contain requirements that are consistent with those in the present edition of the SPRI VF-1 standard. However, in actual fact, the language in the IFC is that Sections 317.2, 317.3 and 317.4 are based on an old edition of the SPRI VF-1 standard and, thus, most of the requirements are unnecessary.

Note that Section 1505.10 of the IBC requires that vegetative roofs be installed per the SPRI VF-1 standard. Thus, this proposal simply cleans up section 317 of the IFC and replaces the term "landscaped roofs" with "vegetative roofs". It also clarifies that section 1505.10 of the IBC (controlled by the IFC) applies to both vegetative roofs and landscaped roofs and that the SPRI standard contains the requirements for vegetative roofs. The fire classification for all types of such roofs is contained in section 1505.1 of the IBC and is not delegated to the SPRI industry standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not impact how vegetative roofs are designed and constructed as both the IBC and IFC will refer to the same edition of the SPRI standard.

FCAC 1.4-2d IFC 317 Vegetative roofs (6145)

FCAC 1.5.1 COMBUSTIBLE MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALL (6777)

IBC: SECTION 1409, 1405.2

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Delete without substitution:

~~**SECTION 1409 PLASTIC COMPOSITE DECKING**~~

Revise as follows:

~~**1409.1**~~ **1405.2 Plastic composite decking.** Exterior deck boards, *stair* treads, *handrails* and *guards* constructed of plastic composites, including but not limited to plastic lumber, shall comply with Section 2612.

FCAC 1.5.2 “Exterior wall assembly”, “Exterior wall envelope” and “Exterior wall” (6779)

IBC: [A] 107.2.4, [A] 110.3.9, SECTION 202, 1202.3, SECTION 1401, 1401.1, SECTION 1402, 1402.1, 1402.2, [BS] 1402.3, 1402.4, 1402.5, [BS] 1402.6, [BS] 1402.7, SECTION 1403, 1403.1, 1403.2, [BS] 1403.3, [BS] 1403.3.1, [BS] 1403.3.2, [BS] 1403.4, [BS] 1403.5, [BS] 1403.5.1, [BS] 1403.5.2, [BS] 1403.5.3, [BS] 1403.6, [BS] 1403.7, 1403.12, 1403.13, 1404.1, 1404.2, TABLE 1404.3(3), 1404.4, 1404.4.1, 1404.5, [BS] 1404.10.1.3, [BS] 1404.17, 1406.2, 1406.8, 1406.12, 1408.2, 1408.8, [BG] 1511.6.2, 2603.5.5, 3113.3

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

[A] 107.2.4 Exterior wall assembly ~~envelope~~.
Construction documents for all buildings shall describe the *exterior wall assembly ~~envelope~~* in sufficient detail to determine compliance with this code. The *construction documents* shall provide details of the *exterior wall assembly ~~envelope~~* as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive barrier and details around openings.

The *construction documents* shall include manufacturer’s installation instructions that provide supporting documentation that the proposed penetration and opening details described in the *construction documents* maintain the weather resistance of the *exterior wall assembly ~~envelope~~*. The supporting documentation shall fully describe the *exterior wall* assembly ~~system~~ that was tested, where applicable, as well as the test procedure used.

[A] 110.3.9 Energy efficiency inspections. Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: building thermal envelope insulation *R*- and *U*-values, *fenestration U*-value, duct system *R*-value, and HVAC and water-heating equipment efficiency.

[BF] CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface of the building thermal envelope.

[BF] EXTERIOR WALL ASSEMBLY ~~ENVELOPE~~. A system~~, or assembly of~~ including the ~~exterior wall,~~ *exterior wall covering*, framing and components, ~~including exterior wall finish materials,~~ such as *weather-resistive barriers*, air barriers, and insulating materials. This system ~~that~~ provides protection of the building structural members~~, including framing and sheathing materials,~~ and conditioned interior space, from the detrimental effects of the exterior environment.

1202.3 Unvented attic and unvented enclosed rafter assemblies.
Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings applied directly to the underside of the roof framing members/rafters and the structural roof sheathing at the top of the roof framing members shall be permitted where all of the following conditions are met:

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing *underlayment* above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.

5. Insulation shall comply with either Item 5.1 or 5.2, and additionally Item 5.3.

5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing.

5.1.2. Where air-permeable insulation is provided inside the building thermal envelope, it shall be installed in accordance with Item 5.1.1. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the *R*-values in Table 1202.3 for condensation control.

5.1.3. Where both air-impermeable and air-permeable insulation are provided, the *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the R-values in Table 1202.3 for condensation control. The *air-permeable insulation* shall be installed directly under the *air-impermeable insulation*.

5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

5.2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in unvented attics shall meet the following requirements:

5.2.1. A vapor diffusion port shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port.

5.2.2. The port area shall be greater than or equal to $^1/_{600}$ of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement.

5.2.3. The vapor-permeable membrane in the vapor diffusion port shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96.

5.2.4. The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building.

5.2.5. The vapor diffusion port shall protect the attic against the entrance of rain and snow.

5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (50 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space.

5.2.7. The roof slope shall be greater than or equal to 3 units vertical in 12 units horizontal (3:12).

5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing, on top the attic floor, or on top of the ceiling.

5.2.9. Where only air-permeable insulation is used and is installed directly below the structural roof sheathing, air shall be supplied at a flow rate greater than or equal to 50 cubic feet per minute (23.6 L/s) per 1,000 square feet (93 m^2) of ceiling.

5.3. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.

2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

SECTION 1401 GENERAL

Revise as follows:

1401.1 Scope. The provisions of this chapter shall establish the minimum requirements for *exterior walls*; *exterior wall assemblies,* *exterior wall coverings*; *exterior wall* openings; exterior windows and doors; and architectural *trim.*

SECTION 1402 PERFORMANCE REQUIREMENTS

Revise as follows:

1402.1 General. The provisions of this section shall apply to *exterior walls*, *exterior wall coverings* and components thereof.

1402.2 Weather protection.
~~*Exterior walls* shall provide the building~~ Buildings shall be provided with a weather-resistant *exterior wall assembly* ~~*envelope*~~. The *exterior wall assembly* ~~*envelope*~~ shall include flashing, as described in Section 1404.4. The *exterior wall assembly* ~~*envelope*~~ shall be designed and constructed in such a manner as to prevent the accumulation of water within the *exterior wall assembly* by providing a *water-resistive barrier* behind the exterior *veneer*, as described in Section 1403.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the *exterior wall assembly* shall be provided in accordance with Section 1404.3.

Exceptions:

1. A weather-resistant *exterior wall assembly* ~~*envelope*~~ shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1403.2 and 1404.4, shall not be required for an *exterior wall assembly* ~~*envelope*~~ that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E331 under the following conditions:

   The *exterior wall* ~~*envelope*~~ design shall be considered to resist wind-driven rain where the results of testing , in accordance with ASTM E331, indicate that water did not penetrate control joints in the *exterior wall* ~~*envelope*~~, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

   2.1. *Exterior wall* ~~*envelope*~~ test assemblies shall include not fewer than one opening, one control joint, one wall/eave interface and one wall sill. Tested openings and penetrations shall be representative of the intended end-use configuration.

   2.2. *Exterior wall* ~~*envelope*~~ test assemblies shall be not less than 4 feet by 8 feet (1219 mm by 2438 mm) in size.

   2.3. *Exterior wall* ~~*envelope*~~ test assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (0.297 kN/m^2).

   2.4. *Exterior wall* ~~*envelope*~~ test assemblies shall be subjected to a minimum test exposure duration of 2 hours.

3. *Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

[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.

1402.4 Fire resistance. *Exterior walls* shall be fire-resistance rated as required by other sections of this code with opening protection as required by Chapter 7.

Revise as follows:

1402.5 Water-resistive barriers.
Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.Combustibility shall be determined in accordance with Section 703.3. For the purposes of

this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. ~~Walls~~ *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has ~~a~~ an *exterior wall covering* of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. ~~Walls~~ *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

   2.2 A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

[BS] 1402.6 Flood resistance. For buildings in *flood hazard areas* as established in Section 1612.3, *exterior walls* extending below the elevation required by Section 1612 shall be constructed with flood-damage-resistant materials.

[BS] 1402.7 Flood resistance for coastal high-hazard areas and coastal A zones. For buildings in *coastal high-hazard areas* and coastal A zones as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through *exterior walls* that are designed to break away under *flood loads*.

SECTION 1403 MATERIALS

1403.1 General. Materials used for the construction of *exterior walls* shall comply with the provisions of this section. Materials not prescribed herein shall be permitted, provided that any such alternative has been *approved*.

1403.2 Water-resistive barrier.
Not fewer than one layer of *water-resistive barrier* material shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous *water-resistive barrier* behind the exterior wall *veneer*. *Water-resistive barriers* shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. ASTM E331 in accordance with Section 1402.2.
4. Other approved materials installed in accordance with the manufacturer's installation instructions.

[BS] 1403.3 Wood. *Exterior walls* of wood construction shall be designed and constructed in accordance with Chapter 23.

[BS] 1403.3.1 Basic hardboard. Basic *hardboard* shall conform to the requirements of ANSI A135.4.

[BS] 1403.3.2 Hardboard siding. *Hardboard* siding shall conform to the requirements of ANSI A135.6 and, where used structurally, shall be so identified by the *label* of an *approved* agency.

[BS] 1403.4 Masonry. *Exterior walls* of masonry construction shall be designed and constructed in accordance with this section and Chapter 21. *Masonry units*, *mortar* and metal accessories used in anchored and adhered *veneer* shall meet the physical requirements of Chapter 21. The backing of anchored and adhered *veneer* shall be of concrete, masonry, steel framing or wood framing. Continuous insulation meeting the applicable requirements of this code shall be permitted between the backing and the masonry *veneer*.

[BS] 1403.5 Metal. *Exterior walls* constructed of cold-formed or structural steel shall be designed in accordance with Chapter 22. *Exterior walls* constructed of aluminum shall be designed in accordance with Chapter 20.

[BS] 1403.5.1 Aluminum siding. Aluminum siding shall conform to the requirements of AAMA 1402.

[BS] 1403.5.2 Cold-rolled copper. Copper shall conform to the requirements of ASTM B370.

[BS] 1403.5.3 Lead-coated copper. Lead-coated copper shall conform to the requirements of ASTM B101.

[BS] 1403.6 Concrete. *Exterior walls* of concrete construction shall be designed and constructed in accordance with Chapter 19.

[BS] 1403.7 Glass-unit masonry *Exterior walls* of glass-unit masonry shall be designed and constructed in accordance with Chapter 21.

1403.12 Polypropylene siding. *Polypropylene siding* shall be certified and labeled as conforming to the requirements of D7425/D7425M—13 and those of Section 1403.12.1 or 1403.12.2 by an approved quality control agency. *Polypropylene siding* shall be installed in accordance with the requirements of Section 1404.18 and in accordance with the manufacturer's instructions. *Polypropylene siding* shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.

Revise as follows:

1403.13 Foam plastic insulation. Foam plastic insulation used in *exterior wall* ~~*covering*~~ *assemblies* shall comply with Chapter 26.

1404.1 General. *Exterior wall coverings* shall be designed and constructed in accordance with the applicable provisions of this section.

1404.2 Weather protection. *Exterior walls* shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1404.2 shall be acceptable as *approved* weather coverings.

Revise as follows:

TABLE 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]
4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R12.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R20 over 2 × 6 wall

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, and other approved vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the *building thermal envelope* requirements of the International Energy Conservation Code.

1404.4 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the *exterior wall* or to redirect that moisture to the surface of the *exterior wall covering* ~~finish~~ or to a *water-resistive barrier* complying with Section 1403.2 and that is part of a means of drainage complying with Section 1402.2. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim. Where self-adhered membranes are used as flashings of *fenestration* in *exterior wall assemblies*, those self-adhered flashings shall comply with AAMA 711. Where fluid applied membranes are used as flashing for *exterior wall* openings, those fluid applied membrane flashings shall comply with AAMA 714.

1404.4.1 Exterior wall pockets. In *exterior walls* of buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with caps or drips, or other *approved* means shall be provided to prevent water damage.

1404.5 Wood veneers.
Wood *veneers* on *exterior walls* of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior *hardboard* siding or 0.375-inch (9.5 mm) exterior-type *wood structural panels* or particleboard and shall conform to the following:

1. The *veneer* shall not exceed 40 feet (12 190 mm) in height above grade. Where *fire-retardant-treated wood* is used, the height shall not exceed 60 feet (18 290 mm) in height above grade.
2. The *veneer* is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.
3. Where open or spaced wood *veneers* (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

[BS] 1404.10.1.3 Clearances. On exterior stud walls, *adhered masonry veneer* shall be installed not less than 4 inches (102 mm) above the earth, or not less than 2 inches (51 mm) above paved areas, or not less than $^1/_2$ inch (12.7 mm) above exterior walking surfaces that are supported by the same foundation that supports the *exterior wall*.

Revise as follows:

[BS] 1404.17 Fastening. Weather boarding and *exterior wall coverings* shall be securely fastened with aluminum, copper, zinc, zinc-coated or other *approved* corrosion-resistant fasteners in accordance with the nailing schedule in Table 2304.10.2 or the *approved* manufacturer's instructions. Shingles and other weather coverings shall be attached with appropriate standard-shingle nails to furring strips securely nailed to studs, or with *approved* mechanically bonding nails, except where sheathing is of wood not less than 1-inch (25 mm) nominal thickness or of *wood structural panels* as specified in Table 2308.6.3(3).

1406.2 Exterior wall covering. MCM used as *exterior wall* covering or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1406.4 through 1406.13 .

Revise as follows:

1406.8 Fire-resistance rating.
Where MCM systems are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the *building official* that the required *fire-resistance rating* is maintained.

> **Exception:** MCM systems that are part of an *exterior wall* assembly ~~envelope~~ not containing foam plastic insulation and are installed on the outer surface of a fire-resistance-rated *exterior wall* in a manner such that the attachments do not penetrate through the entire *exterior wall* assembly, shall not be required to comply with this section.

1406.12 Foam plastic insulation. Where MCM systems are included in an *exterior wall* assembly ~~envelope~~ containing foam plastic insulation, the *exterior wall* assembly ~~envelope~~ shall also comply with the requirements of Section 2603.

1408.2 Exterior wall covering. HPL used as *exterior wall covering* or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1408.4 through 1408.14.

1408.8 Fire-resistance rating.
Where HPL systems are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the building official that the required *fire-resistance rating* is maintained.

> **Exception:** HPL systems not containing foam plastic insulation, which are installed on the outer surface of a fire-resistance-rated *exterior wall* in a manner such that the attachments do not penetrate through the entire *exterior wall* assembly, shall not be required to comply with this section.

Revise as follows:

[BG] 1511.6.2 Type I, II, III or IV construction.
Regardless of the requirements in Section 1511.6, *mechanical equipment screens* that are located on the *roof decks* of buildings of Type I, II, III or IV construction shall be permitted to be constructed of combustible materials in accordance with any one of the following limitations:

1. The *fire separation distance* shall be not less than 20 feet (6096 mm) and the height of the *mechanical equipment screen* above the roof deck shall not exceed 4 feet (1219 mm) as measured to the highest point on the *mechanical equipment screen*.
2. The *fire separation distance* shall be not less than 20 feet (6096 mm) and the *mechanical equipment screen* shall be constructed of *fire-retardant-treated wood* complying with Section 2303.2 for exterior installation.
3. Where *exterior wall covering* panels are used, the panels shall have a *flame spread index* of 25 or less when tested in the minimum and maximum thicknesses intended for use, with each face tested independently in accordance with ASTM E84 or UL 723. The panels shall be tested in the minimum and maximum thicknesses intended for use in accordance with, and shall comply with the acceptance criteria of, NFPA 285 and shall be installed as tested. Where the panels are tested as part of an *exterior wall assembly* in accordance with NFPA 285, the panels shall be installed on the face of the *mechanical equipment screen* supporting structure in the same manner as they were installed on the tested *exterior wall assembly*.

2603.5.5 Vertical and lateral fire propagation.
The *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

1. One-*story* buildings complying with Section 2603.4.1.4.

2. ~~Wall~~ *Exterior wall assemblies* where the foam plastic insulation is covered on each face by not less than 1-inch (25 mm) thickness of masonry or concrete and meeting one of the following:

    2.1. There is no airspace between the insulation and the concrete or masonry.

    2.2. The insulation has a *flame spread index* of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1 inch (25 mm).

3113.3 Manufacturer's data plate.
Each relocatable module shall have a data plate that is permanently attached on or adjacent to the electrical panel, and shall include the following information:

1. Occupancy group.
2. Manufacturer's name and address.
3. Date of manufacture.
4. Serial number of module.
5. Design *roof live load*, design floor *live load*, snow *load*, wind and seismic design.
6. *Approved* quality assurance agency or *approved* inspection agency.
7. Codes and standards of construction.
8. ~~Envelope thermal~~ Thermal resistance values of the building thermal envelope.
9. Electrical service size.
10. Fuel-burning equipment and size.
11. Special limitations if any.

FCAC 1.5.3 Triggers for NFPA 285 (6843)

IBC: 1402.5 (New), 1402.5.1 (New), 1402.5.2 (New), 1402.5.3 (New), 1402.5.4 (New), 1402.5.5 (New), 1402.6, [BS] 1402.7, [BS] 1402.8

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new text as follows:

1402.5 Vertical and lateral flame propagation. Exterior walls on buildings of Type I, II, III and IV construction that are greater than 40 feet (12,192 mm) in height above grade plane and contain a combustible exterior wall covering, combustible insulation, or a combustible water-resistive barrier shall comply with Sections 1402.5.1 through 1402.5.5, as applicable. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 1402.5.5, the exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

1402.5.1 Combustible Water resistive barrier. Exterior walls containing a combustible water-resistive barrier shall comply with Section 1402.6.

1402.5.2 Metal Composite Materials (MCM). Exterior walls containing MCM systems shall comply with Section 1406.

1402.5.3 Exterior insulation and finish system (EIFS). Exterior walls of any height above grade plane containing EIFS shall comply with Section 1407.

1402.5.4 High-pressure decorative exterior-grade compact laminate (HPL) system. Exterior walls containing an HPL system shall comply with Section 1408.

1402.5.5 Foam Plastic Insulation. Exterior walls of any height above grade plane containing foam plastic insulation shall comply with Section 2603.5.

Revise as follows:

~~1402.5~~ 1402.6 Water-resistive barriers.
Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.Combustibility shall be determined in accordance with Section 703.3. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

   2.2 A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

[BS] ~~1402.6~~ 1402.7 Flood resistance. For buildings in *flood hazard areas* as established in Section 1612.3, *exterior walls* extending below the elevation required by Section 1612 shall be constructed with flood-damage-resistant materials.

[BS] ~~1402.7~~ 1402.8 Flood resistance for coastal high-hazard areas and coastal A zones. For buildings in *coastal high-hazard areas* and coastal A zones as established in Section 1612.3, electrical, mechanical and plumbing

system components shall not be mounted on or penetrate through *exterior walls* that are designed to break away under *flood loads*.

Reason Statement: This code proposal simply moves plastic composite decking from its current Section 1409 to a new subsection under Section 1405 Combustible Materials on the Exterior Side of Exterior Walls.
Plastic composite decking is best placed under Section 1405 because these products (deck boards, stair treads, handrails and guards and plastic lumber) contain plastic composite materials, which are combustible. These products are installed on the exterior side of exterior walls, but are not exterior wall coverings. Furthermore, the current location for plastic composite decking in Section 1409 is easily missed, as it is the last section in Chapter 14.

The provisions for plastic composite decking have not been changed and the pointer to Section 2612 for additional requirements remains. A pointer to the requirements contained in chapter 26 (section 2612) is needed because chapter 26 deals primarily with the materials while Chapter 14 deals more specifically with the actual products for which the materials are used.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply the relocation of the provisions to a more appropriate location so the requirements are not overlooked.

FCAC 2.1.1(a) Low Frequency Group I-1 (6380)

IFC: 907.5.2.1.3, 907.5.2.1.3.1, 907.5.2.1.3.2; IBC: [F] 907.5.2.1.3, [F] 907.5.2.1.3.1, [F] 907.5.2.1.3.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.5.2.1.3 Audible alarm signal frequency in Group R-1 ~~and~~ R-2 , and I-1 sleeping rooms. Audible alarm signal frequency in Group R-1 ~~and~~ R-2 , and I-1 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.

907.5.2.1.3.1 Fire alarm system audible signal. In sleeping rooms of Group R-1 ~~and~~ R-2 , and I-1 occupancies, the audible alarm signal activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.

907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Group R-1 ~~and~~ R-2 , and I-1 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible alarm signal activated by single- or multiple-station smoke alarms in the *dwelling unit*or *sleeping unit* shall be a 520-Hz signal complying NFPA 72.
Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz alarm signal shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.

2021 International Building Code

Revise as follows:

[F] 907.5.2.1.3 Audible alarm signal frequency in Group R-1 ~~and~~ R-2 and I-1 sleeping rooms. Audible alarm signal frequency in Group R-1 ~~and~~ R-2 and I-1 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.

[F] 907.5.2.1.3.1 Fire alarm system audible signal. In sleeping rooms of Group R-1 ~~and~~ R-2 , and I-1 occupancies, the audible alarm signal activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.

[F] 907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Group R-1 ~~and~~ R-2 , and I-1 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible *alarm signal* activated by single- or multiple-station smoke alarms in the *dwelling unit* or *sleeping unit* shall be a 520-Hz signal complying with NFPA 72. Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz *alarm signal* shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.

FCAC 2.1.3 (a) 1 Smoke Alarm Maintenance (6172)

IFC: 907.10, 907.10.2 (New), 907.10.1 (New); IPMC: [F] 704.7, 704.7.1 (New), 704.7.2 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.10 Smoke alarm maintenance. Smoke alarms shall be tested and maintained in accordance with the manufacturer's published instructions and this code.

~~Smoke alarms shall be replaced: when they fail to respond to operability tests or when they exceed 10 years from the date of manufacture unless an earlier replacement is specified in the manufacturer's published instructions.~~

Add new text as follows:

907.10.2 Replacement. Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails to respond to operability tests or does not function
2. Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's published instructions.
3. The smoke alarm end-of-life signal is sounded.
4. The smoke alarm date of manufacturer cannot be determined.

907.10.1 Original construction. Smoke alarms installed in compliance with the adopted building code at the time of their installation shall be permitted in accordance with 907.10.2.

2021 International Property Maintenance Code

Revise as follows:

[F] 704.7 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be tested and maintained in accordance with the manufacturer's published instructions and this code.
~~Smoke alarms shall be replaced:~~
~~-that do not function shall be replaced.~~
~~-Smoke alarms installed in one- and two-family dwellings shall be replaced not more than 10 years from the date of manufacture marked on the unit,~~
~~or shall beeplaced if the date of manufacture cannot be determined.~~

Add new text as follows:

704.7.1 Original construction. Single- and multiple-station smoke alarms installed in accordance with the adopted building code at the time of their installation shall be permitted in accordance with 704.7.2.

704.7.2 Replacement. Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails to respond to operability tests or does not function Enter text
2. Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's published instructions.
3. The smoke alarm end-of-life signal is sounded.
4. The smoke alarm date of manufacturer cannot be determined.

FCAC 2.1.3 (a) Smoke Alarm Installation (Near Cooking) (6062)

IFC: 907.2.11, 907.2.11.3; IBC: [F] 907.2.11, [F] 907.2.11.3; IPMC: [F] 704.6, [F] 704.6.1.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

907.2.11 Single- and multiple-station smoke alarms. *Listed* single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.7 , ~~, and~~ NFPA 72 and the manufacturer's published instructions.

907.2.11.3 Installation near cooking appliances.
Smoke alarms shall ~~not~~ be installed a minimum of 10 ft (3.0 m) horizontally from a permanently installed cooking appliance. in ~~the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:~~

Exception:
Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) horizontally from a permanent;y installed cooking appliance where necessary to comply with Section 907.2.11.1 or 907.2.11.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

2021 International Building Code

Revise as follows:

[F] 907.2.11 Single- and multiple-station smoke alarms. *Listed* single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.7 , ~~, and~~ NFPA 72 and the manufacturer's published instructions.

[F] 907.2.11.3 Installation near cooking appliances.
Smoke alarms shall ~~not~~ be installed a minimum of 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance. ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:~~

Exception:
Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance where necessary to comply with Section 907.2.11.1 or 907.2.11.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

2021 International Property Maintenance Code

[F] 704.6 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in

existing Group I-1 and R *occupancies* in accordance with Sections 704.6.1 through 704.6.3.

Revise as follows:

[F] 704.6.1.3 Installation near cooking appliances.
Smoke alarms shall ~~not~~ be installed a minimum of 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 704.6.1.1 or 704.6.1.2~~.

Exception: Smoke alarms shall be permitted to be installed between 6 ft. (1.8 m) and 10 ft. (3.0 m) from a permanently installed cooking appliance where necessary to comply with Section 704.6.1 or 704.6.2.

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 m) horizontally from a permanently installed cooking appliance.~~
2. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
3. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

FCAC 2.1.5(a) WG Two-Way Communication (6595)

IFC: 1032.8, 1032.8.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1032.8 Inspection, testing and maintenance. ~~Two-way communication systems shall be inspected and tested on a yearly basis to verify that all components are operational. Where required, the tests shall be conducted in the presence of the *fire code official*. Records of inspection, testing and maintenance shall be maintained.~~
The inspection, testing and maintenance for two-way communication systems shall be in accordance with this code and NFPA 72, and shall not be conducted less than annually or more frequently where required by the fire code official.

Add new text as follows:

1032.8.1 Records. Records of inspections, testing and maintenance shall be maintained on site in an *approved* cabinet at the command center or a location approved by the *fire code official.*

FCAC 2.3.1 CO Detection 1 (7034)

IFC: 915.5, 915.5.1, 915.5.3, 915.5.2, 915.5.4 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through ~~915.5.3~~ 915.5.4.

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.5.3 Combination detectors. Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are *listed* in accordance with UL 268 and UL 2075.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

915.5.4 Duct detection. Carbon monoxide detectors placed in environmental air ducts or plenums shall not be used as a substitute for the required protection in Section 915 of the Code.

FCAC 2.3.2 and 2.3.3 CO Detection 2 (7037)

IFC: 915.5, 915.5.1, 915.5.2, NFPA Chapter 80; IBC: [F] 915.5, [F] 915.5.1, NFPA Chapter 35, [F] 915.5.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

Revise as follows:

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 72 ~~720~~. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 72 ~~720~~.

Delete without substitution:

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

2021 International Building Code

Revise as follows:

[F] 915.5 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

[F] 915.5.1 General. Carbon monoxide detection systems shall comply with NFPA ~~720~~ 72. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

Delete without substitution:

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

Revise as follows:

[F] 915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA ~~720~~ 72.

Reason Statement: This Proposal seeks to enhance the ability of residents in and I-1 Occupancies to awakened by the fire alarm system or smoke alarm by requiring the 520 Hz low frequency audible alarm signal. This proposal is needed because residents in I-1 Occupancies do not rely on trained staff to wake them and they are able to self-evacuate the building. Another FPRF Report, Waking Effectiveness of Alarms for Adults Who Are Hard of Hearing, concludes the 520 Hz low frequency is six times more effective than the standard 3 KHz signal at waking high risk segments of the population (people over 65, people who are hard of hearing, school age children and people who are alcohol impaired). The standard 3 KHz audible alarm signal has been used in all fire alarm horns and smoke alarms for the past 30 years.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Cost Impact: The code change will increase cost of construction. The total installation cost will only increase in new R-1, R-2 and I-1 occupancies where a fire alarm system is required by Section 907 by requiring the use of the 520 Hz low frequency audible fire alarm signal in sleeping rooms of these occupancies. In accordance with the included cost analysis the “estimated” price increase is $57 per sleeping room for occupancies that are not required to utilize an emergency voice alarm communication (EVAC) system for occupant notification and approximately $107 per sleeping room for occupancies that are required to utilize an (EVAC) system for occupant notification.

For non-EVAC systems, the solution utilizes a currently available smoke detector with an integral low frequency sounder base instead of installing a smoke alarm and low frequency horn. For EVAC systems, the solution utilizes a currently available fire alarm system speaker and a smoke detector with an integral low frequency sounder base.

FCAC 2.3.4 CO Detection 4 (7081)

IPMC: [F] 705.2, NFPA Chapter 08

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Property Maintenance Code

Revise as follows:

[F] 705.2 Carbon monoxide alarms and detectors. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 72 ~~720~~. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

Delete without substitution:

~~**720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~

Reason Statement: : In August 2015, the NFPA Standards Council voted to relocate the material in the 2015 edition of NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, into the 2019 edition of NFPA 72, *National Fire Alarm and Signaling Code*. This Proposal replaces references to NFPA 720 with NFPA 72.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only changes a reference standard.

FCAC 2.7.1 Water supply (6312)

IFC: 914.3.2; IBC: [F] 403.3.3

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

914.3.2 Secondary water supply. An automatic secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement in accordance with Section 903.3.1.1, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by the *International Building Code*. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with ~~NFPA 13~~ Section 903.3.1.1.

2021 International Building Code

Revise as follows:

[F] 403.3.3 Secondary water supply. An *automatic* secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement in accordance with Section 903.3.1.1, shall be provided for *high-rise buildings* assigned to *Seismic Design Category* C, D, E or F as determined by Section 1613. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with ~~NFPA 13~~ Section 903.3.1.1.

FCAC 3.1.1 Exit Sign Maintenance (6524)

IFC: [BE] 1032.4, 1032.4.1 (New), 1032.4.1.1 (New), 1032.4.1.2 (New), 1032.4.2 (New), 1032.4.2.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

[BE] 1032.4 Exit signs. Exit signs shall be installed and maintained in accordance with the building code that was in effect at the time of construction and the applicable provisions in Section 1104. Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the *exit* shall not be allowed. Regardless of type, all exit signs shall be immediately discernable to indicate the route of egress.

Add new text as follows:

1032.4.1 Internally illuminated exit signs. Electrically powered, self-luminous and photoluminescent exist signs shall be maintained in accordance with Sections 1032.4.1.1 and 1032.4.1.2.

1032.4.1.1 Testing. Testing of internally illuminated exit signs shall be on a monthly basis. The test shall be performed manually or by an automated self-testing and self-diagnostic routine. Where testing is performed by self-testing or self-diagnostics, a visual inspection of the exit sign equipment shall also be conducted to identify any equipment displaying a trouble indicator or that has become damaged or otherwise impaired. Signs to be immediately discernable from the route of egress.

1032.4.1.2 Record Keeping. Records shall be maintained documenting monthly testing and maintenance for exit signs. Records shall be maintained on site for a period of not less than three years.

1032.4.2 Externally illuminated exit signs. Externally illuminated exit signs shall be inspected on a monthly basis. The function of the external illumination shall be verified and the sign inspected for damage or other impairment. Signs to be immediately discernable from the route of egress.

1032.4.2.1 Record Keeping. Records shall be maintained documenting monthly testing and maintenance for exit signs. Records shall be maintained on site for a period of not less than three years.

FCAC 3.4.1 Construction Fire Safety Reorganization (7050)

IFC: CHAPTER 33, SECTION 3301, 3301.1, 3301.2, SECTION 3302, 3302.1, SECTION 3303, 3303.1, 3303.1.1, 3303.2, 3303.2.1, 3303.3, 3303.3.1, 3303.4, 3303.5, 3303.5.1, 3303.5.2, 3303.5.2.1, 3303.5.2.2, 3303.5.2.3, 3303.5.3, 3303.5.4, 3303.6, SECTION 3304, 3304.1, 3304.1.1, 3304.1.2, 3304.1.3, 3304.2, SECTION 3305, 3305.1, 3305.1.1, 3305.1.2, 3305.1.3, 3305.1.4, 3305.1.5, 3305.2, 3305.3, 3305.4, 3305.5, 3305.6, 3305.7, 3305.8, 3305.9, 3305.10, 3305.10.1, 3305.10.2, SECTION 3306, 3306.1, 3306.2, 3306.3, 3306.4, 3306.5, 3306.5.1, 3306.6, SECTION 3307, 3307.1, 3307.1.2, [BE] 3307.1.3, 3307.1.4, 3307.2, 3307.2.1, 3307.2.2, 3307.2.2.1, 3307.2.2.2, 3307.2.2.3, 3307.3, 3307.4, 3307.5, 3307.5.1, 3307.5.2, SECTION 3308, 3308.1, SECTION 3309, 3309.1, 3309.1.1, 3309.1.2, 3309.1.3, 3309.1.4, 3309.1.5, 3309.2, 3309.2.1, 3309.2.2, 3309.3, 3309.3.1, 3309.3.2, SECTION 3310, 3310.1, SECTION 3311, 3311.1, SECTION 3312, 3312.1, SECTION 3312, SECTION 3313, SECTION 3314, SECTION 3315, SECTION 3316, SECTION 3318

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 33
FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION 3301 GENERAL

3301.1 Scope. This chapter shall apply to structures in the course of construction, *alteration* or demolition, including those in underground locations. Compliance with NFPA 241 is required for items not specifically addressed herein.

3301.2 Purpose. This chapter prescribes minimum safeguards for construction, *alteration* and demolition operations to provide reasonable safety to life and property from fire during such operations.

SECTION 3302 DEFINITIONS

3302.1 Terms defined in Chapter 2. Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

Revise as follows:

SECTION 3303 ~~OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~ ADMINISTRATIVE SAFETY CONTROLS

3303.1 Program development and maintenance. The *owner* or *owner's* authorized agent shall be responsible for the development, implementation and maintenance of an *approved* , written *site safety plan* establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, *alteration* or demolition work. The plan shall be submitted and *approved* before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff and staff training requirements. The plan shall be submitted for approval.

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security.

12. Changes that affect this plan.

13. Other site-specific information required by the *fire code official*.

3303.2 Site safety director. The *owner* shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the *site safety plan*. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the site safety director shall be responsible for the guard service.

Revise as follows:

~~**3303.6**~~ **3303.2.1 Training.** Training of fire watch and other responsible personnel in the use of fire protection equipment shall be the responsibility of the site safety director. Records of training shall be kept and made a part of the written plan for the *site safety plan*.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.
10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.

3303.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 112.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 112.3. Upon the third offense, the *fire code official* is authorized to issue a stop work order in accordance with Section 113, and work shall not resume until satisfactory assurances of future compliance have been presented to and *approved* by the *fire code official*.

3303.4 Qualifications. Site safety directors shall acquire training specific to their roles and responsibilities. Upon request, the training and qualifications of the site safety director shall be submitted to the *fire code official* for approval.

Revise as follows:

~~**3305.5**~~ **3303.5 Fire watch.** Where required by the *fire code official* or the *site safety plan* established in accordance withSection 3303.1, a fire watch shall be provided for building demolition and for building construction.

~~**3305.5.1**~~ **3303.5.1 Fire watch during construction.** A fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade at any point along the building perimeter, for new multistory construction with an aggregate area exceeding 50,000 square feet (4645 m^2) per story or as required by the *fire code official.*

~~**3305.5.2**~~ **3303.5.2 Fire watch personnel.** Fire watch personnel shall be provided in accordance with this section.

~~**3305.5.2.1**~~ **3303.5.2.1 Duties.** The primary duty of fire watch personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable.

~~3305.5.2.2~~ 3303.5.2.2 **Training.** Personnel shall be trained to serve as an on-site fire watch. Training shall include the use of portable fire extinguishers. Fire extinguishers and fire reporting shall be in accordance with Section 3310.

~~3305.5.2.3~~ 3303.5.2.3 **Means of notification.** Fire watch personnel shall be provided with not fewer than one *approved* means for notifying the fire department.

~~3305.5.3~~ 3303.5.3 **Fire watch location and records.** The fire watch shall include areas specified by the *site safety plan* established in accordance with Section 3303.

~~3305.5.4~~ 3303.5.4 **Fire watch records.** Fire watch personnel shall keep a record of all time periods of duty, including the log entry for each time the site was patrolled and each time a structure was entered and inspected. Records shall be made available for review by the *fire code official* upon request.

~~3310.1~~ 3303.6 **Emergency telephone.** Emergency telephone facilities with *ready access* shall be provided in an *approved* location at the construction site, or an *approved* equivalent means of communication shall be provided. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone. Alternatively, where an equivalent means of communication has been *approved*, the site address and fire department emergency telephone number shall be posted at the main entrance to the site, in guard shacks and in the construction site office.

SECTION 3304 ~~TEMPORARY HEATING EQUIPMENT~~ PROTECTION OF COMBUSTIBLE MATERIALS

~~3305.2~~ 3304.1 **Combustible debris, rubbish and waste.** Combustible debris, rubbish and waste material shall comply with the requirements of Sections 3305.2.1 through 3305.2.4.

~~3305.2.1~~ 3304.1.1 **Combustible waste material accumulation.** Combustible debris, rubbish and waste material shall not be accumulated within buildings.

~~3305.2.2~~ 3304.1.2 **Combustible waste material removal.** Combustible debris, rubbish and waste material shall be removed from buildings at the end of each shift of work.

~~3305.2.3~~ 3304.1.3 **Rubbish containers.**
Where rubbish containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) are used for temporary storage of combustible debris, rubbish and waste material, they shall have tight-fitting or self-closing lids. Such rubbish containers shall be constructed entirely of materials that comply with either of the following:

1. Noncombustible materials.
2. Materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.

~~3305.2.4~~ 3304.2 **Spontaneous ignition.** Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a *listed* disposal container.

SECTION 3305 ~~PRECAUTIONS AGAINST FIRE~~ IGNITION SOURCE CONTROLS

~~3304.1~~ 3305.1 **Listed.** Temporary heating devices shall be *listed* and *labeled*. The installation, maintenance and use of temporary heating devices shall be in accordance with the listing and the manufacturer's instructions.

~~3304.2~~ 3305.1.1 **Oil-fired heaters.** Oil-fired heaters shall comply with Section 605.

~~3304.3~~ 3305.1.2 **LP-gas heaters.** Fuel supplies for liquefied-petroleum gas-fired heaters shall comply with Chapter 61 and the *International Fuel Gas Code*.

~~3304.4~~ 3305.1.3 **Refueling.** Refueling operations for liquid-fueled equipment or appliances shall be conducted in accordance with Section 5705. The equipment or appliance shall be allowed to cool prior to refueling.

~~3304.5~~ 3305.1.4 **Installation.** Clearance to combustibles from temporary heating devices shall be maintained in accordance with the *labeled* equipment. When in operation, temporary heating devices shall be fixed in place and protected from damage, dislodgement or overturning in accordance with the manufacturer's instructions.

~~3304.6~~ 3305.1.5 **Supervision.** The use of temporary heating devices shall be supervised and maintained only by competent personnel.

~~3305.1~~ 3305.2 **Smoking.** Smoking shall be prohibited except in *approved* areas. Signs shall be posted in accordance with Section 310. In *approved* areas where smoking is permitted, *approved* ashtrays shall be provided in accordance with Section 310.

3305.3 Burning of combustible debris, rubbish and waste. Combustible debris, rubbish and waste material shall

not be disposed of by burning on the site unless *approved*.

3305.4 Open burning. *Open burning* shall comply with Section 307.

Revise as follows:

~~**3305.6**~~ **3305.5 Cutting and welding.** Welding, cutting, open torches and other hot work operations and equipment shall comply with Chapter 35.

~~**3305.7**~~ **3305.6 Electrical.** Temporary wiring for electrical power and lighting installations used in connection with the construction, *alteration* or demolition of buildings, structures, equipment or similar activities shall comply with NFPA 70.

~~**3305.8**~~ **3305.7 Cooking.**
Cooking shall be prohibited except in *approved* designated cooking areas separated from combustible materials by a minimum of 10 feet (3048 mm). Signs with a minimum letter height of 3 inches (76 mm) and a minimum brush stroke of $^1/_2$ inch (13 mm) shall be posted in conspicuous locations in designated cooking areas and state:

DESIGNATED COOKING AREA
COOKING OUTSIDE OF A DESIGNATED
COOKING AREA IS PROHIBITED

~~**3309.1**~~ **3305.8 General.** Portable generators used at construction and demolition sites shall comply with Section 1204.

~~**3303.8**~~ **3305.9 Hot work operations.** The site safety director shall ensure hot work operations and permit procedures are in accordance with Chapter 35.

~~**3318.1**~~ **3305.10 Safeguarding roof operations** ~~**General.**~~ Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections 3318.2 and 3318.3 and Chapter 35.

~~**3318.2**~~ **3305.10.1 Asphalt and tar kettles.** Asphalt and tar kettles shall be operated in accordance with Section 303.

~~**3318.3**~~ **3305.10.2 Fire extinguishers for roofing operations.** Fire extinguishers shall comply with Section 906. There shall be not less than one multiple-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating on the roof being covered or repaired.

SECTION 3306 ~~**FLAMMABLE AND COMBUSTIBLE LIQUIDS**~~ **FIRE PROTECTION SYSTEMS AND DEVICES**

~~**3303.7**~~ **3306.1 Fire protection devices.** The site safety director shall ensure that all fire protection equipment is maintained and serviced in accordance with this code. Fire protection equipment shall be inspected in accordance with the fire protection program.

~~**3303.9**~~ **3306.2 Impairment of fire protection systems.** The site safety director shall ensure impairments to any *fire protection system* are in accordance with Section 901.

~~**3303.9.1**~~ **3306.3 Smoke detectors and smoke alarms.** Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

~~**3303.10**~~ **3306.4 Temporary covering of fire protection devices.** Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

~~**3315.1**~~ **3306.5 Automatic Sprinkler system.** ~~**Completion before occupancy.**~~ In buildings where an *automatic sprinkler system* is required by this code or the *International Building Code*, it shall be unlawful to occupy any portion of a building or structure until the *automatic sprinkler system* installation has been tested and *approved*, except as provided in Section 105.3.4.

~~**3315.2**~~ **3306.5.1 Operation of valves.** Operation of sprinkler control valves shall be allowed only by properly authorized personnel and shall be accompanied by notification of duly designated parties. Where the sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at the end of each work period to ascertain that protection is in service.

~~**3316.1**~~ **3306.6** ~~**Where required.**~~ **Portable fire extinguishers**
Structures under construction, *alteration* or demolition shall be provided with not less than one *approved* portable fire extinguisher in accordance with Section 906 and sized for not less than ordinary hazard as follows:

1. At each *stairway* on all floor levels where combustible materials have accumulated.

2. In every storage and construction shed.
3. Additional portable fire extinguishers shall be provided where special hazards exist including, but not limited to, the storage and use of *flammable* and *combustible liquids.*

SECTION 3307 ~~FLAMMABLE GASES~~ FIRE DEPARTMENT SITE ACCESS AND WATER SUPPLY

~~3311.1~~ 3307.1 Required access. *Approved* vehicle access for fire fighting shall be provided to all construction or demolition sites. Vehicle access shall be provided to within 100 feet (30 480 mm) of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

~~3311.2~~ 3307.1.2 Key boxes. Key boxes shall be provided as required by Chapter 5.

[BE] ~~3312.1~~ 3307.1.3 Stairways required. Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided. As construction progresses, such *stairway* shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~3312.2~~ 3307.1.4 Maintenance.
Required *means of egress* and required *accessible means of egress* shall be maintained during construction and demolition, remodeling or *alterations* and additions to any building.

Exception: *Approved* temporary *means of egress* and *accessible means of egress systems* and facilities.

~~3313.1~~ 3307.2 ~~When required.~~ Water supply for fire protection.
An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction and on installation of a standpipe system in buildings under construction, in accordance with Sections 3307.2.1 through 3307.4.~~3313.2 through 3313.5~~.

Exception: The *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

~~3313.2~~ 3307.2.1 Combustible building materials. When combustible building materials of the building under construction are delivered to a site, a minimum fire flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used to provide this fire-flow supply shall be within 500 feet (152 m) of the combustible building materials, as measured along an *approved* fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 500 feet (152 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

~~3313.3~~ 3307.2.2 Vertical construction of Types III, IV and V construction. Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Sections 3307.2.2.1 through 3307.2.2.3 ~~3313.3.1 through 3313.3.3~~ shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

~~3313.3.1~~ 3307.2.2.1 Fire separation up to 30 feet. Where a building of Type III, IV or V construction has a *fire separation distance* of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide either a minimum of 500 gallons per minute (1893 L/m) or the entire fire flow required for the building when constructed, whichever is greater.

~~3313.3.2~~ 3307.2.2.2 Fire separation of 30 feet up to 60 feet. Where a building of Type III, IV or V construction has a fire separation distance of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide a minimum of 500 gallons per minute (1893 L/m) or 50 percent of the fire flow required for the building when constructed, whichever is greater.

~~3313.3.3~~ 3307.2.2.3 Fire separation of 60 feet or greater. Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property *lot line*, a water supply of 500 gallons per minute (1893 L/m) shall be provided.

~~3313.4~~ 3307.3 Vertical construction, Type I and II construction. If combustible building materials are delivered

to the construction site, water supply in accordance with Section 3313.2 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.

~~3313.5~~ 3307.4 Standpipe supply. Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3314, a water supply providing a minimum flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

~~3314.1~~ 3307.5 ~~Where required.~~ Standpipes. In buildings required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed prior to construction exceeding 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipes shall be provided with fire department hose connections at locations adjacent to *stairways* complying with Section 3307.1.3 ~~3312.1~~. As construction progresses, such standpipes shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~3314.2~~ 3307.5.1 Buildings being demolished. Where a building is being demolished and a standpipe is existing within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

~~3314.3~~ 3307.5.2 Detailed requirements.
Standpipes shall be installed in accordance with the provisions of Section 905.

Exception: Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes comply with the requirements of Section 905 as to capacity, outlets and materials.

SECTION ~~3317~~ 3308 MOTORIZED CONSTRUCTION EQUIPMENT

~~3317.1~~ 3308.1 Conditions of use.
Internal-combustion-powered construction equipment shall be used in accordance with all of the following conditions:

1. Equipment shall be located so that exhausts do not discharge against combustible material.
2. Exhausts shall be piped to the outside of the building.
3. Equipment shall not be refueled while in operation.
4. Fuel for equipment shall be stored in an *approved* area outside of the building.

SECTION ~~3308~~ 3309 ~~EXPLOSIVE MATERIALS~~ HAZARDOUS MATERIALS

~~3306.1~~ 3309.1 Storage of flammable and combustible liquids. Storage of *flammable* and *combustible liquids* shall be in accordance with Section 5704.

~~3306.2~~ 3309.1.1 Class I and Class II liquids. The storage, use and handling of *flammable* and *combustible liquids* at construction sites shall be in accordance with Section 5706.2. Ventilation shall be provided for operations involving the application of materials containing flammable solvents.

~~3306.3~~ 3309.1.2 Housekeeping. *Flammable* and *combustible liquid* storage areas shall be maintained clear of combustible vegetation and waste materials. Such storage areas shall not be used for the storage of combustible materials.

~~3306.4~~ 3309.1.3 Precautions against fire. Sources of ignition and smoking shall be prohibited in *flammable* and *combustible liquid* storage areas. Signs shall be posted in accordance with Section 310.

~~3306.5~~ 3309.1.4 Handling at point of final use. Class I and II liquids shall be kept in *approved* safety containers.

~~3306.6~~ 3309.1.5 Leakage and spills. Leaking vessels shall be immediately repaired or taken out of service and spills shall be cleaned up and disposed of properly.

~~3307.1~~ 3309.2 Storage and handling of flammable gas. The storage, use and handling of flammable gases shall comply with Chapter 58.

~~3307.2~~ 3309.2.1 Cleaning with flammable gas. Flammable gases shall not be used to clean or remove debris from piping open to the atmosphere.

~~3307.2.1~~ 3309.2.2 Pipe cleaning and purging.
The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. *Compressed gas* piping systems other than fuel gas piping systems where in accordance with Chapter 53.
2. Piping systems regulated by the *International Fuel Gas Code*.
3. Liquefied petroleum gas systems in accordance with Chapter 61.

~~3308.1~~ 3309.3 Storage and handling. *Explosive* materials shall be stored, used and handled in accordance with Chapter 56.

~~3308.2~~ 3309.3.1 Supervision. Blasting operations shall be conducted in accordance with Chapter 56.

~~3308.3~~ 3309.3.2 Demolition using explosives. *Approved* fire hoses for use by demolition personnel shall be maintained at the demolition site wherever *explosives* are used for demolition. Such fire hoses shall be connected to an *approved* water supply and shall be capable of being brought to bear on post-*detonation* fires anywhere on the site of the demolition operation.

SECTION ~~3309~~ 3310 ~~PORTABLE GENERATORS~~ ADDITIONAL SAFEGUARDS FOR OCCUPIED BUILDINGS

~~3312.3~~ 3310.1 Storage. Combustible materials associated with construction, demolition, remodeling or *alterations* to an occupied structure shall not be stored in *exits*, enclosures for *stairways* and *ramps*, or *exit access corridors* serving an occupant load of 30 or more.

Exceptions:

1. Where the only occupants are construction workers.
2. Combustible materials that are temporarily accumulated to support work being performed when workers are present.

SECTION ~~3310~~ 3311 ~~FIRE REPORTING~~ ADDITIONAL SAFEGUARDS FOR TYPE I & II CONSTRUCTION

~~3305.9~~ 3311.1 Separations between construction areas. Separations used in Type I and Type II construction to separate construction areas from occupied portions of the building shall be constructed of materials that comply with one of the following:

1. Noncombustible materials.
2. Materials that exhibit a flame spread index not exceeding 25 when tested in accordance with ASTM E84 or UL 723.
3. Materials exhibiting a peak heat release rate not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation on specimens at the thickness intended for use.

SECTION ~~3311~~ 3312 ~~ACCESS FOR FIRE FIGHTING~~ ADDITIONAL SAFEGUARDS FOR TYPE IV CONSTRUCTION

~~3303.5~~ 3312.1 Fire safety requirements for buildings of Types IV-A, IV-B and IV-C construction. Buildings of Types IV-A, IV-B and IV-C construction designed to be greater than six stories above *grade plane* shall comply with the following requirements during construction unless otherwise *approved* by the *fire code official*:

1. Standpipes shall be provided in accordance with Section 3313.
2. A water supply for fire department operations, as *approved* by the *fire code official* and the *fire chief*.
3. Where building construction exceeds six stories above *grade plane* and noncombustible protection is required by Section 602.4 of the *International Building Code*, at least one layer of noncombustible protection shall be installed on all building elements on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

4. Where building construction exceeds six stories above *grade plane*, required exterior wall coverings shall be installed on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

   Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

Delete without substitution:

~~**SECTION 3312 MEANS OF EGRESS**~~

~~**SECTION 3313 WATER SUPPLY FOR FIRE PROTECTION**~~

~~**SECTION 3314 STANDPIPES**~~

~~**SECTION 3315 AUTOMATIC SPRINKLER SYSTEM**~~

~~**SECTION 3316 PORTABLE FIRE EXTINGUISHERS**~~

~~**SECTION 3318 SAFEGUARDING ROOFING OPERATIONS**~~

Reason Statement: The purpose of this proposal is to clarify the intent of the code section. High-rise buildings will be subject to both NFPA 13 provisions, which have a hose stream requirement, as well as NFPA 14 provisions, which set forth the total hose demand for the standpipe system. The current wording does not clarify which hose demand is to be used in calculating the volume of the secondary water supply. There is significant difference in the required flow rate between the two hose demands. The proposal seeks to clarify that secondary water supply volume is to incorporate the hose stream demand from NFPA 13 only and is not required to satisfy the hose demand from NFPA 14. In keeping with formatting of the I-codes in general, reference to NFPA 13 by name is proposed to be changed to a reference to Section 903.3.1.1.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impact to construction as it is intended to clarify the intent of this section. Clarifies that NFPA 14 standpipe requirements are not intended to be included.

FCAC 3.4.1 Construction Fire Safety Reorganization (7050)

FCAC 4.1.1 Correlation (6822)

IFC: 1207.1.1 (New), 1207.1.2 (New), TABLE 1207.1.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

1207.1.1 Utilities and Industrial applications. This section shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities used in applications such as flexible ac transmission (FACTS) devices, filter capacitor banks, power factor correction, and standalone capacitor banks for voltage correction and stabilization.

1207.1.2 Mobile ESS. Mobile ESS deployed at an electric utility substation or generation facility for 90 days or less shall not add to the threshold values in Table 1207.1 for the stationary ESS installation if both of the following conditions apply:

1. The mobile ESS complies with Section 1207.10.
2. The mobile ESS is only being used during periods in which the facility's stationary ESS is being tested, repaired, retrofitted or replaced.

Revise as follows:

TABLE 1207.1.1
ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

TECHNOLOGY	**ENERGY CAPACITY[a]**
Capacitor ESS	3 kWh
Flow batteries[b]	20 kWh
ESS in one- and two-family dwellings and townhouse units	1 kWh
Lead-acid batteries, all types	70 kWh[c]
Lithium-ion batteries	20 kWh
Socium nickel chloride batteries ~~Nickel metal hydride (Ni-MH)~~	70 kWh
Nickel-cadmium batteries (Ni-Cd), Nickel Metal Hydride (Ni-MH), and Nickel Zinc (Ni-Zn) batteries	70 kWh
Non-electrochemical ESS[d]	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Zinc manganese dioxide batteries (Zn-MnO2)	70 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

c. Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

~~d. Section 1207 shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities used in applications such as flexible ac transmission (FACTS), filter capacitor banks, power factor correction, and stand-alone capacitor banks for voltage correction and stabilization.~~

d. Covers nonelectrochemical technologies such as flywheel and thermal ESS

FCAC 4.1.11 Fire suppression exceptions (7017)

IFC: 1207.5.5, UL Chapter 80 (New), Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.5 Fire suppression systems. Rooms and areas within buildings and walk-in units containing electrochemical ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. ~~An~~Automatic sprinkler systems ~~system designed and installed in accordance with Section 903.3.1.1~~ for ESS units (groups) with a maximum stored energy capacity of 50 kWh, as described in 1207.5.1, shall be designed with a minimum density of 0.3 gpm/ft^2 (1.1 l/min) based ~~on the fire area~~ over the area of the room or 2500 ft^2 (232 m^2) design area, whichever is smaller, unless a lower density is approved based upon large-scale fire testing in accordance with 1207.1.5.
2. ~~Where *approved*, an *automatic sprinkler system* designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification~~ Automatic sprinkler systems for ESS units (groups) exceeding 50 kWh shall use a density based on large-scale fire testing complying with Section 1207.1.5.
3. The following alternative automatic fire-extinguishing systems designed and installed in accordance with Section 904, provided that the installation is *approved* by the *fire code official* based on large-scale fire testing complying with Section 1207.1.5:

    3.1. NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*.

    3.2. NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*.

    3.3. NFPA 750, *Standard on Water Mist Fire Protection Systems*.

    3.4. NFPA 2001, *Standard on Clean Agent Fire-Extinguishing Systems*.

    3.5. NFPA 2010, *Standard for Fixed Aerosol Fire-Extinguishing Systems*.

Exceptions:

1. Fire suppression systems for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall not be required to have a fire suppression system installed.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located shall not be required to have a fire suppression system.

Add new standard(s) as follows:

1778-2014: : Uninterruptible Power Systems

Add new text as follows:

Chapter 80 IEEE
C2-2017 National Electrical Safety Code(R) (NESC(R))

FCAC 4.1.12 (7018)

IFC: TABLE 1207.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 1207.6
ELECTROCHEMICAL ESS TECHNOLOGY-SPECIFIC REQUIREMENTS

COMPLIANCE REQUIRED[b]		BATTERY TECHNOLOGY						OTHER ESS AND BATTERY TECHNOLOGIES[b]	CAPACITOR ESS[b]
Feature	**Section**	Lead-acid	Nickel cadmium (Ni-Cd), ~~and~~ nickel metal hydride (Ni-MH) and nickel zinc (Ni-Zn)	Zinc Manganese dioxide (Zn MnO2)	Lithium-ion	Flow	Sodium nickel chloride		
Exhaust ventilation	1207.6.1	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Explosion control	1207.6.3	Yes[a]	Yes[a]	Yes	Yes	No	Yes	Yes	Yes
Safety caps	1207.6.4	Yes	Yes	No	No	No	No	Yes	Yes
Spill control and neutralization	1207.6.2	Yes[c]	Yes[c]	Yes[f]	No	Yes	No	Yes	Yes
Thermal runaway	1207.6.5	Yes[d]	Yes	Yes[e]	Yes[e]	No	Yes	Yes[e]	Yes

a. Not required for lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.8.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented-type (i.e., flooded) nickel-cadmium and lead-acid batteries.

d. Not required for vented-type (i.e., flooded) lead-acid batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

f. Not required for batteries with jelled electrolyte.

FCAC 4.1.13 Explosion control exceptions (7019)

IFC: 1207.6.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.6.3 Explosion control. Where required by Table 1207.6 or elsewhere in this code, explosion control complying with Section 911 shall be provided for rooms, areas,ESS cabinets or ESS walk-in units containing electrochemical ESS technologies.

Exceptions:

1. Where *approved*, explosion control is permitted to be waived by the *fire code official* based on large-scale fire testing complying with Section 1207.1.5 that demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules ~~where tested in accordance with UL 9540A~~.
2. Where *approved*, explosion control is permitted to be waived by the *fire code official* based on documentation provided in accordance with Section 104.7 that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.
3. Where approved, ESS cabinets that have no debris, shrapnel, or enclosure pieces ejected during large scale fire testing complying with Section 1207.1.5 shall be permitted in lieu of providing explosion control complying with Section 911.
4. Explosion control is not required for lead-acid and nickel cadmium battery systems less than 50 V ac, 60 V dc in telecommunication facilities under the exclusive control of communications utilities located in building spaces or walk-in units used exclusively for such installations.
5. Explosion control is not required for lead-acid and nickel cadmium systems designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility located in building spaces or walk-in units used exclusively for such installations.
6. Explosion control is not required for lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and housed in a single cabinet in a single fire area in buildings or walk-in units.

FCAC 4.1.14 (7025)

IFC: 1207.10.1, 1207.10.2, Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.10.1 Charging and storage. For the purpose of Section 1207.10, charging and storage covers the operation where mobile ESS are charged and stored so they are ready for deployment to another site, and where they are charged and stored after a deployment.

Exception: Mobile ESS used to temporarily provide power to lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

1207.10.2 Deployment. For the purpose of Section 1207.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

Exception:
Mobile ESS used to temporarily provide power to lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

Add new standard(s) as follows:

Chapter 80 IEEE C2

FCAC 4.1.15 Hazard mitigation revisions (7028)

IFC: 1207.1.4, 1207.1.4.1, 1207.1.4.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.1.4 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other *approved* hazard mitigation analysis shall be provided in accordance with Section 104.8.2 under any of the following conditions:

1. Where ESS technologies not specifically identified in Table 1207.1.1 are provided.
2. More than one ESS technology is provided in a ~~room or enclosed~~ single fire area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities. See Section 1207.5.2.
4. Where required by the fire code official to address a potential hazard with an ESS installation that is not addressed by existing requirements.

1207.1.4.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single electrochemical ESS ~~rack, module or~~ unit.
2. A mechanical failure of a non-electrochemical ESS unit.

~~2.~~ 3. Failure of any battery (energy) management system or fire protection system within the ESS equipment that is not covered by the product listing failure mode effects analysis (FMEA).

~~3.~~ 4. Failure of any required ~~ventilation or exhaust system~~ protection system external to the ESS including but not limited to ventilation (HVAC), exhaust ventilation, smoke detection, fire detection, gas detection or fire suppression system.

~~4. Voltage surges on the primary electric supply.~~

~~5. Short circuits on the load side of the ESS.~~

~~6. Failure of the smoke detection, fire detection, fire suppression or gas detection system.~~

~~7. Required spill neutralization not being provided or failure of a required secondary containment system.~~

1207.1.4.2 Analysis approval. The *fire code official* is authorized to approve the hazardous mitigation analysis provided that the consequences of the hazard mitigation analysis demonstrate:

1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance-rated separations identified in Section 1207.7.4.
2. Fires involving the ESS will allow occupants or the general public to evacuate to a safe location. ~~in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.~~
3. ~~Toxic and highly toxic gases released during fires will not reach concentrations in excess of the IDLH level in the building or adjacent *means of egress* routes during the time deemed necessary to evacuate occupants from any affected area.~~
4. ~~Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).~~
5. ~~Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases, preventing accumulation, or by *deflagration* venting.~~

FCAC 4.1.16 Applicability to Utilities (7033)

IFC: 1201.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy including but not limited to energy storage systems under the exclusive control of an electric utility or lawfully designated agency. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

FCAC 4.1.17 ESS in Group R-3 and R-4 (7035)

IFC: 1207.1, 1207.11, 1207.11.1, 1207.11.2, 1207.11.2.1, 1207.11.3, 1207.11.4, 1207.11.5, 1207.11.6, 1207.11.7, 1207.11.8, 1207.11.9

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in Group R-3 and R-4 occupancies shall only be required to comply with Section 1207.11 except where Section 1207.11.4 requires compliance with Sections 1207.1 through 1207.9.

1207.11 ESS in Group R-3 and R-4 occupancies. ESS in Group R-3 and R-4 occupancies shall be ~~installed and maintained~~ in accordance with Sections 1207.11.1 through 1207.11.9. ~~The temporary use of an *owner* or occupant's electric-powered vehicle as an ESS shall be in accordance with Section 1207.11.10.~~

Exceptions:

1. ESS listed and labeled in accordance with UL 9540 and marked “For use in residential dwelling units”, where installed in accordance with the manufacturer’s instructions and NFPA 70.
2. ESS rated less than 1 kWh (3.6 megajoules).

1207.11.1 Equipment listings. ESS shall be *listed* and *labeled* in accordance with UL 9540. ~~ESS *listed* and *labeled* solely for utility or commercial use shall not be used for residential applications.~~

Exceptions:

1. ~~Where *approved*, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.~~
2. ~~ESS less than 1 kWh (3.6 megajoules).~~

1207.11.2 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing.

1207.11.2.1 Spacing. Individual ESS units shall be separated from each other by at least 3 feet (914 mm) ~~of spacing unless~~ except where smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 1207.1.5.

1207.11.3 Location. ESS shall be installed only in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the *dwelling unit* living space and *sleeping units* in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors or on the exterior side of exterior walls located a minimum of 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed Utility closets, basements, ~~and~~ storage or utility spaces within *dwelling units* and *sleeping units* with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8 in. Type X gypsum wallboard.

.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

1207.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating of the ESS ~~structure~~ shall not exceed:

1. 40 kWh within utility closets, basements, and storage or utility spaces.

2. 80 kWh in attached or detached garages and detached accessory structures.
3. 80 kWh on exterior walls.
4. 80 kWh outdoors on the ground.

ESS installations exceeding the permitted individual or aggregate ratings shall be installed in accordance with Section 1207.1 through 1207.9.

1207.11.5 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters *listed* for utility interaction.

1207.11.6 Fire detection. Rooms and areas within *dwellings units*, *sleeping units*, *basements* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11. A *heat detector listed* and interconnected to the smoke alarms shall be installed in locations within *dwelling units*, *sleeping units* and attached garages where smoke alarms cannot be installed based on their listing.

1207.11.7 Protection from impact. ~~Stationary storage battery systems~~ ESS installed in a location subject to vehicle damage shall be protected by *approved* barriers. ~~Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code*.~~

1207.11.8 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with exhaust ventilation in accordance with Section 304.5 of the *International Mechanical Code* ~~1207.6.1~~.

Delete without substitution:

~~**1207.11.9 Toxic and highly toxic gas.**~~
~~ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.~~

Revise as follows:

~~**1207.11.10**~~ **1207.11.9 Electric vehicle use.** The temporary use of an *owner* or occupant's electric-powered vehicle to power a *dwelling unit* or *sleeping unit* while parked in an attached or detached garage or outdoors ~~outside~~ shall comply with the vehicle manufacturer's instructions and NFPA 70.

FCAC 4.1.2 Utilities applicability (6824)

IFC: 1207.1.3.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

1207.1.3.1 Utilities applicability. Plans and specifications associated with ESS owned and operated by electric utilities as a component of the electric grid that are considered critical infrastructure documents in accordance with the provisions of the North American Electric Reliability Corporation and other applicable governmental laws and regulations shall be made available to the fire code official for viewing based on the requirements of the applicable governmental laws and regulations.

FCAC 4.1.3 Commissioning exceptions (6827)

IFC: 1207.2.1, Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.2.1 Commissioning. Commissioning of newly installed ESS and existing ESS that have been retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been *approved* prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.
2. A listing of the specific ESS and associated components, controls and safety-related devices to be tested, a description of the tests to be performed and the functions to be tested.
3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.
4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.
5. Verification that required equipment and systems are installed in accordance with the *approved* plans and specifications.
6. Integrated testing for all fire and safety systems.
7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.
8. Preparation and delivery of operation and maintenance documentation.
9. Training of facility operating and maintenance staff.
10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.
11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.
12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

Exceptions:

~~Commissioning shall not be required for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. A decommissioning plan shall be provided and maintained where required by the fire code official.~~

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities and located outdoors or in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76 shall be permitted to have a commissioning plan in compliance with recognized industry practices in lieu of complying with 1207.2.1.
2. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utilities, and located in building spaces or walk-in units used exclusively for such installations shall be permitted to have a commissioning plan in compliance with applicable governmental laws and regulations in lieu of developing a commissioning plan in accordance with 1207.2.1.

Add new text as follows:

Chapter 80 IEEE C2- 2017

National Electrical Safety Code(R) (NESC(R))

FCAC 4.1.4 Exceptions to UL 9540 (6832)

IFC: 1207.3.1, Chapter 80 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.3.1 Energy storage system listings. ESS shall be *listed* in accordance with UL 9540.

Exceptions: ~~Lead-acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76, are not required to be *listed*.~~

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations that are in compliance with NFPA 76.
2. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778 and utilized for standby power applications.

Add new text as follows:

Chapter 80 IEEE C2-2017 National Electrical Safety Code(R) (NESC(R))

Add new standard(s) as follows:

1778-2014 - with revisions through October 2017 : Uninterruptible Power Systems

FCAC 4.1.5 Exception to retrofit (6840)

IFC: 1207.3.7.1, UL Chapter 80 (New), Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.3.7.1 Retrofitting lead acid and nickel cadmium. ~~Section 1207.3.7 shall not apply to~~ Changing out or retrofitting of lead-acid and nickel-cadmium batteries with other lead-acid and nickel-cadmium batteries in the following applications shall be considered repairs where there is no increase in system size or energy capacity greater than 10 percent of the original design

1. At ~~at~~ facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.
2. Battery systems designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Batteries in uninterruptible power supplies listed and labeled in accordance with UL 1778 and used for standby power applications only.

Add new standard(s) as follows:

1778-2014: Uninterruptible Power Systems - with revisions through October 2017

Add new text as follows:

Chapter 80 IEEE C2-2017 National Electrical Safety Code(R) (NESC(R))

FCAC 4.1.7 Exceptions ESS Group Size (6842)

IFC: 1207.5.1, Chapter 80 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 kWh (180 megajoules). Each group shall be separated a minimum of 3 feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and limited to not more than 10% of the floor area on the floor on which the ESS is located.

~~2.~~ 4. The *fire code official* is authorized to approve larger capacities or smaller separation distances based on large-scale fire testing complying with Section 1207.1.5.

Add new text as follows:

Chapter 80 IEEE C2-2017 National Electrical Safety Code(R) (NESC(R))

Add new standard(s) as follows:

1778-2014: : Uninterruptible Power Systems

FCAC 4.1.8 New battery types (6847)

IFC: TABLE 1207.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 1207.5
MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS

TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES [a]
STORAGE BATTERIES	
Flow batteries[b]	600 kWh
Lead-acid, all types	Unlimited
Lithium-ion	600 kWh
Sodium nickel chloride ~~Nickel metal hydride (Ni-MH)~~	~~Unlimited~~ 600kWh
Nickel-cadmium (Ni-Cd), Nickel metal hydride (NI-MH) and nickel zinc (Ni-Zn)	Unlimited
Other battery technologies	200 kWh
CAPACITORS	
All types	20 kWh
OTHER ELECTROCHEMICAL ESS	
All types	20 kWh
Zinc Manganese dioxide (Zn-MnO2)	Unlimited

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For electrochemical ESS units rated in amp-hours, kWh shall equal rated voltage times the amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

FCAC 4.1.9 Elevation Exceptions (6851)

IFC: 1207.5.3, Chapter 80 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.
2. Where the floor is located below the lowest *level of exit discharge*.

Exceptions:

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control and safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located.

~~2.~~ 4. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.

~~3.~~ 5. Where *approved* by the *fire code official,* installations shall be permitted on higher and lower floors.

Add new text as follows:

Chapter 80 IEEE
C2-2017 National Electrical Safety Code(R) (NESC(R))

Add new standard(s) as follows:

1778-2014: Uninterruptible Power Systems

Reason Statement: The proposed new Section 1207.1.1 is consistent with NFPA 855 Section 10.1.4. The changes to Table 1207.1.1 are consistent with NFPA 855 Table 1.3. Data has been provided previously to address addition of nickel zinc (Ni-Zn), zinc manganese dioxide (Zn-MnO2) and sodium nickel chloride batteries to the table. The table now also covers non-electrochemical ESS, consistent with how it is treated in NFPA 855.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This has the potential to lower costs since it recognizes new electrochemical ESS technologies, which are no longer classified under the more stringent ”other” technology provisions.

FCAC 4.4.3 (6381)

IFC: 1205.2.3, 1205.2, UL Chapter 80 (New)

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1205.2.3 Building-integrated photovoltaic (BIPV) systems. Where building-integrated photovoltaic (BIPV) systems are installed in a manner that creates areas with electrical hazards to be hidden from view, markings shall be provided to identify the hazardous areas to avoid. The markings shall be reflective and be visible from grade.

Exception: BIPV systems *listed* in accordance with UL 3741 ~~Section 690.12(B)(2) of NFPA 70~~, where the removal or cutting away of portions of the BIPV system during fire-fighting operations have been determined to not expose a fire fighter to electrical shock hazards.

1205.2 Access and pathways.
Roof access, pathways and spacing requirements shall be provided in accordance with Sections 1205.2.1 through 1205.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

Exceptions:

1. Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises and similar structures.
2. Roof access, pathways and spacing requirements need not be provided where the *fire code official* has determined that rooftop operations will not be employed.
3. Building-integrated photovoltaic (BIPV) systems where the BIPV systems are *approved*, integrated into the finished roof surface and are *listed* in accordance with UL 3741 ~~a national test standard developed to address Section 690.12(B)(2) of NFPA 70~~. The removal or cutting away of portions of the BIPV system during fire-fighting operations shall not expose a fire fighter to electrical shock hazards.

Add new text as follows:

UL 3741-2020: Photovoltaic Hazard Control

FCAC 4.4.5 Non-Roof BIPV (6981)

IFC: SECTION 1410 (New); IBC: 1410.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

SECTION 1410 BIPV SYSTEMS FOR EXTERIOR WALL COVERINGS AND FENESTRATION

1410.1 Listing required. In addition to complying with other provisions of this code, BIPV systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

2021 International Building Code

Add new text as follows:

1410.1 Listing required. In addition to complying with other provisions of this code, BIPV systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

Reason Statement: UL 3741 is the national test standard developed to address Section 690.12(B)(2) of NFPA 70. It is a consensus standard developed specifically for the evaluation and testing of rapid shutdown systems and equipment. This proposal will provide clarity on the specific requirements to be used for listing these systems and equipment, and provide the performance anticipated by rapid shutdown operations.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is identifying the standard already referred to indirectly within the code.

FCAC 4.4.5 Non-Roof BIPV (6981)

FCAC 5.1.1 (a) Indoor Plant Cultivation Operational Permit (6608)

IFC: 105.6.39 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

105.6.39 Indoor plant cultivation An operational permit is required for plant cultivation where a CO_2 enriched environment is created.

Reason Statement: The creation of a carbon dioxide enriched environment as a specific part of a process introduces an additional risk to occupants of the building. Requiring a permit allows for the fire code official to review and enforce requirements to mitigate the specific risk.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Final costs would vary based on the type and size of system present. A common single station unit used in restaurants runs $750.00 and often may be purchased from carbon dioxide supplier. Pipes systems in buildings with multiple rooms may install a carbon monoxide detection system; these systems would be similar to other types of gas detection systems.

FCAC 5.1.1 (b) Chapter 39 - General Section Revisions (6609)

IFC: CHAPTER 39, 3901.1, 3901.4 (New), 3901.5 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

CHAPTER 39
PLANT PROCESSING AND EXTRACTION FACILITIES

3901.1 Scope. Facilities where ~~a~~ plant processing ; including cultivation and other related activities; or where either pre-extraction or post-extraction are conducted ~~facilities~~ shall comply with this chapter and the *International Building Code*. ~~The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery.~~ The use, storage, transfilling and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the *International Building Code*.

Exception:
Greenhouses in compliance with IBC Section 31 not utilizing CO2 enrichment.

Add new text as follows:

3901.4 Lighting Where used, horticultural lights or lighting systems shall be listed and labeled in accordance with UL 8800, and installed in accordance with the listing, the manufacturer's installation instructions, and NFPA 70.

3901.5 Carbon Dioxide Generation Carbon dioxide enriched atmospheres generated using methods to create carbon dioxide as a by-product shall meet the requirements of Section 5307.4.1 through 5307.4.7.

Add new standard(s) as follows:

ANSI/CAN/UL 8800-2019:
Standard for Horticultural Lighting Equipment And Systems

FCAC 5.1.3 Ventilation (6611)

IFC: 3905.3 (New), 3905.3.1 (New), 3905.3.2 (New), 3905.3.3 (New), 3905.3.4 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3905.3 Ventilation Continuous mechanical exhaust ventilation shall be provided in accordance with Section 3905.3.1 through 3905.3.4, and Chapter 4 of the International Mechanical Code.

3905.3.1 Extraction processes using flammable gases or combustible liquids Continuous mechanical exhaust ventilation shall provide a minimum airflow rate of not less than 5 cfm/ft2 (0.0038 m3/(s*m2)) of floor area to prevent an accumulation of flammable vapors from exceeding 25 percent of the lower explosive limit (LEL). Recirculation of such air is prohibited.

> **Exception:** Where the registered design professional demonstrates that an engineered mechanical exhaust ventilation system design will prevent the maximum concentration of contaminants from exceeding 25% of the LEL, the minimum required rate of exhaust shall be reduced in accordance with such engineered system design.

3905.3.2 Extraction processes using compressed asphyxiant or inert gases Continuous mechanical exhaust ventilation shall be provided in accordance with Section 5307.2. Recirculation of such air is prohibited.

3905.3.3 Post-extraction processes using flammable or combustible liquids or gases Where flammable liquids, combustible liquids headed above their flashpoint, or flammable gases are used in post-extraction processing the room or area shall be provided with continuous mechanical exhaust in accordance with Section 5004.3.

3905.3.4 Interlocks Electrical equipment and appliances used in processes that generate flammable vapors or gases shall be interlocked with ventilation fans so that the equipment cannot be operated unless the exhaust ventilation fans are in operation.

FCAC 5.1.4 (a) Equipment for freezing or chilling (6613)

IFC: 3903.4.2 (New), UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3903.4.2 Equipment for freezing or chilling flammable solvents or miscella. Where freezers, chillers, or other equipment is used to store or lower the temperature of flammable liquids, the equipment shall be listed for use with flammable liquids in accordance with either UL 471 or UL 60335-2-89, or shall be listed for use in hazardous locations in accordance with NFPA 70.

Add new standard(s) as follows:

471-2010: Standard for Commercial Refrigerators and Freezers

60335-2-89 - 2017: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor

FCAC 5.1.4 (b) Egress (6615)

IFC: 3903.7 (New), 3903.7.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3903.7 Means of Egress Means of egress from rooms or areas used for extraction shall swing in the direction of egress travel.

3903.7.1 Illumination Means of egress illumination within extraction rooms or areas shall be provided with emergency power in accordance with Section 1008.3.

FCAC 5.1.4 (c) Hoods and Electrical for flammable solvents (6614)

IFC: 3903.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3903.5 Use of flammable and combustible liquids.
Where ~~The use of~~ *flammable* ~~and~~ or *combustible* ~~*liquids*~~ solvents are used for ~~liquid~~ extraction processes , such processes ~~where the liquid is boiled, distilled or evaporated~~ shall be located within a chemical ~~hazardous exhaust~~ fume hood, listed or approved ~~rated~~ for exhausting flammable vapors. Electrical equipment used within the ~~hazardous exhaust~~ chemical fume hood or enclosure shall be listed ~~rated~~ for use in flammable atmospheres and installed in accordance with NFPA 70. ~~Heating of *flammable* or *combustible liquids* over an open flame is prohibited.~~

~~**Exception:** The use of a heating element not rated for flammable atmospheres, where documentation from the manufacture, or *approved* testing laboratory indicates the element is rated for heating of *flammable liquids*.~~

FCAC 5.1.4 (d) UL listing for flammable solvent processing (6612)

IFC: 3903.4, UL Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3903.4 Processing using flammable solvents. ~~Post-process purification and winterization.~~ ~~Post-processing and winterization~~ Processes involving the heating or pressurizing of ~~the miscella~~ flammable solvents to other than normal pressure or temperature shall be *approved* and performed in an appliance or equipment *listed* in accordance with UL 1389 or UL 61010-1, and *approved* for such use with the solvent. Domestic or commercial cooking appliances shall not be used.

Add new standard(s) as follows:

1389-2019: Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations

61010-1- 2012: Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

FCAC 5.1.5 Systems and Equipment (6616)

IFC: 3904.1, 3904.2, 3904.2.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

3904.1 General requirements. Systems and equipment used with the processing ~~and~~ or extraction of oils and products from plants shall comply with Sections 3904.2 through 3904.2.2.3 and Section 5003.2, and other applicable provisions of this code, the *International Building Code* and the *International Mechanical Code*.

3904.2 Systems and equipment. Systems or equipment used for the extraction or processing of oils from plant material shall comply with Section 3904.2.1 or 3904.2.2.

3904.2.1 Listings. Systems or equipment used for the extraction or processing of oils from plant material shall be *listed* and *labeled* in accordance with UL 1389 and installed in accordance with the listing and the manufacturer's installation instructions.

FCAC 5.11.1 Temporary and Inflatable Spray Booths (6912)

IFC: 2404.2 (New), 2404.3 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

2404.2 Prohibited enclosures for spray application operations. Inflatable or portable enclosures shall not be used for spray application of flammable finishes.

Exception: Enclosures for the spray application of flammable finishes in marinas, dry docking areas or construction areas shall comply with 2404.3.

2404.3 Membrane enclosures. The design, construction, protection, operation and maintenance of membrane Enclosures shall be in accordance with NFPA 33.

FCAC 5.12.1 Mobile Food Preparation Vehicles (6927)

IFC: 319.1, 319.2, 319.3, 319.4, 319.4.1, 319.4.2, 319.4.3 (New), 319.4.3.1 (New), 319.4.3.2 (New), 319.4.3.3 (New), 319.4.3.4 (New), 319.5, 319.6, 319.7, 319.7.1, 319.7.2, 319.7.3, 319.7.4, 319.7.5, 319.7.5.1, 319.7.5.2, 319.8, 319.8.1, 319.8.2, 319.8.3, 319.8.4, 319.8.5, 319.9, 319.9.1, 319.9.1.1, 319.9.1.2, 319.9.1.3, 319.9.2, 319.9.3, 319.9.4, 319.10.3, 319.10, 319.10.1, 904.13.1, 319.10.2, 105.5.32, 906.1, 904.2.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

319.1 General. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors for the purpose of preparing, cooking, or serving food shall comply with NFPA 96 and this section. Indoor use of mobile food preparation vehicles is prohibited unless approved by the fire code official.

319.2 Permit required. Permits shall be required as set forth in Section 105.5.

319.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood constructed in accordance with Section 606.

319.4 ~~Fire protection.~~ Maintenance. ~~Fire protection shall be provided in accordance with Sections 319.4.1 and 319.4.2.~~

Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.4.1 through 319.4.3.

319.4.1 ~~Fire protection for cooking equipment.~~ Exhaust System. ~~Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.~~

The exhaust system, including hood, grease-removal devices, fans, ducts, and other appurtenances, shall be inspected and cleaned in accordance with NFPA 96.

319.4.2 ~~Fire extinguisher.~~ Fire protection systems and devices. ~~Portable fire extinguishers shall be provided in accordance with Section 906.4.~~

Fire protection systems and devices shall be maintained in accordance with Section 901.6.

319.4.3 Fuel gas systems. Fuel gas systems shall be maintained in accordance with 319.4.3.1 through 319.4.3.4.

319.4.3.1 LP-gas systems LP-gas containers installed on the vehicle and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.2 CNG systems. CNG containers and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.3 Annual leakage test. All fuel gas piping systems and appliances shall be checked annually for leakage at the operating pressure of the system using a manometer or pressure gauge. Where leakage is indicated, the gas supply shall be turned off until repairs have been made and the system no longer leaks.

319.4.3.4 Inspection tag. Upon a satisfactory annual inspection, the approved inspection agency, person or special expert shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of the satisfactory inspection.

319.5 ~~Appliance connection to fuel supply piping.~~ Manual system operation for the automatic fire extinguishing system(s). ~~Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.~~

A manual activation device shall be provided for the automatic fire extinguishing system(s) provided for the cooking

appliance(s). The manual activation device shall be unobstructed and in view from the means of egress, located at or near a means of egress from the cooking area, and at a location acceptable to the fire code official. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the walking surface of the means of egress and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

~~**319.6 Cooking oil storage containers.** Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.~~

~~**319.7 Cooking oil storage tanks.** Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections 319.7.1 through 319.7.5.2.~~

~~**319.7.1 Metallic storage tanks.** Metallic cooking oil storage tanks shall be *listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.~~

~~**319.7.2 Nonmetallic storage tanks.** Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:~~

1. ~~Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.~~
2. ~~Tank capacity shall not exceed 200 gallons (757 L) per tank.~~

~~**319.7.3 Cooking oil storage system components.** Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.~~

~~**319.7.4 Design criteria.** The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.~~

~~**319.7.5 Tank venting.** Normal and emergency venting shall be provided for cooking oil storage tanks.~~

~~**319.7.5.1 Normal vents.** Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.~~

~~**319.7.5.2 Emergency vents.** Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.~~

~~**319.8 LP-gas systems.** Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.~~

~~**319.8.1 Maximum aggregate volume.** The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.~~

~~**319.8.2 Protection of container.** LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.~~

~~**319.8.3 LP-gas container construction.** LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.~~

~~**319.8.4 Protection of system piping.** LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.~~

~~**319.8.5 LP-gas alarms.** A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.~~

~~**319.9 CNG systems.** Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections 319.9.1 through 319.9.4.~~

~~**319.9.1 CNG containers supplying only cooking fuel.** CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections 319.9.1.1 through 319.9.1.3.~~

~~**319.9.1.1 Maximum aggregate volume.** The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.~~

~~**319.9.1.2 Protection of container.** CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.~~

~~**319.9.1.3 CNG container construction.** CNG containers shall be an NGV-2 cylinder.~~

~~**319.9.2 CNG containers supplying transportation and cooking fuel.** Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.~~

~~**319.9.3 Protection of system piping.** CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.~~

~~**319.9.4 Methane alarms.** A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.~~

~~**319.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an *approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.~~

~~**319.10 Maintenance.** Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.10.1 through 319.10.3.~~

~~**319.10.1 Exhaust system.** The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.~~

904.13.1 Manual system operation. A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception:
1. *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

2. *Mobile food preparation vehicles* in accordance with Section 319.

~~**319.10.2 Fire protection systems and devices.** *Fire protection systems* and devices shall be maintained in accordance with Section 901.6.~~

105.5.32 Mobile food preparation vehicles. An operational permit is required for mobile food preparation vehicles equipped with appliances that produce smoke or grease-laden vapors.

906.1 Where required.
Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, ~~and~~ S occupancies~~.~~ and mobile food preparation vehicles in accordance with Section 319.

Exceptions:

1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

   3.1. Use of vehicle-mounted extinguishers shall be *approved* by the *fire code official*.

   3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket *approved* by the extinguisher manufacturer or the *fire code official* for vehicular use.

   3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.

   3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

   3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where *flammable* or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3316.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception:
Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

904.2.2 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Sections 606 and 319 to have a Type I hood shall be protected with an *approved* automatic fire-extinguishing system installed in accordance with this code.

Reason Statement: The proposed scope changes provide additional clarification that the Chapter applies to the full breadth of plant processing intended for the acquisition of oils. This added scope content serves to include provisions for cultivation, as well as more broadly capturing the processing steps identified as “post-extraction.” The post-extraction operations are generally laboratory-scale operations; however, they pose hazards through the use of flammable gases and flammable liquids to refine, purify, or distill the oil and resulting products. Each of these processes has risks and hazards associated with them, such as the use of electrical equipment, use of properly *listed* equipment, hazardous materials management, etc.
Cultivation processes include associated hazards such as carbon dioxide generation and lighting issues. Whereas these provisions are also addressed elsewhere in the Code, the hazards warrant more specific requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are considered clarification that this chapter and other sections of the International Fire Code are to be considered applicable to each phase of processing or extraction when hazardous materials are used or a hazardous condition may be created as a normal part of the process.

FCAC 5.2.1 Coated Wood Panels (6762)

IWUIC: 503.3 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Add new text as follows:

503.3 Coated Wood Panels Coated wood panels used as ignition resistant materials shall be listed and labeled in accordance with the requirements of Section 503.2, where tested on the front and back faces.

FCAC 5.2.2 Ignition-resistant building material (6770)

IWUIC: 503.2

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on the front and back faces ~~all sides~~ with the extended ASTM E84 or UL 723 ~~(UL 723)~~ test or with ASTM E2768~~, except panel products shall be permitted to test only the front and back faces.~~ Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:
   - 1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 ~~and shall not show evidence of progressive combustion following the extended 30-minute test.~~
   - 1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.
   - 1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:
     - 1.3.1. Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.
     - 1.3.2. ASTM D7032 for wood-plastic composite materials.
     - 1.3.3. ASTM D6662 for plastic lumber materials.
   - 1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.
2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

FCAC 5.2.3 Ignition Resistant Material - Evaluating Effects of Weathering on Fire Performance of Plastic Composites via ASTM E1354 Tests (7084)

IWUIC: 503.2, ASTM Chapter 07 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of $^1/_8$ inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion following the extended 30-minute test.

   1.2. Flame front. Material shall exhibit a flame front that does not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

   1.3. ~~Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:~~

   The material shall also maintain its performance under conditions of use by meeting performance requirements for weathering, including exposure to temperature, moisture and ultraviolet radiation, in accordance with the following:

   1.3.1. ~~Method A " Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.~~

   Ignition resistant materials shall demonstrate compliance with the requirements of 503.2 Item 1 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

   1.3.2. ~~ASTM D7032 for wood-plastic composite materials.~~

   Wood-plastic composite materials shall demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D7032, and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10% in peak rate of heat release when compared to the peak heat release rate of the non-weathered material.

   1.3.3. ~~ASTM D6662 for plastic lumber materials.~~

   Plastic lumber composite materials shall demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D6662, and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10% in peak rate of heat release when compared to the peak heat release rate of the non-weathered material.

   1.4 Identification. Materials shall bear identification showing the fire test results.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the International Building Code and classified as Class A *roof assemblies* as required in Section 1505.2 of the International Building Code.

Add new standard(s) as follows:

ASTM E1354-2017: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

FCAC 5.2.4 WUI Vents (6853)

IWUIC: 504.10, 504.10.1 (New), 504.10.2, 505.10, 505.10.1 (New), 505.10.2, 506.5 (New), ASTM Chapter 07 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.10 Vents. ~~Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed $^1/_4$ inch (6.4 mm), or shall be designed and *approved* to prevent flame or ember penetration into the structure.~~
Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 504.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

504.10.1 Requirements. Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1.There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.

2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.

3.The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

~~**504.10.1**~~ **504.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

505.10 Vents. ~~Attic ventilation openings, foundation or underfloor vents or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed $^1/_4$ inch (6.4 mm) or shall be designed and *approved* to prevent flame or ember penetration into the structure.~~
Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 505.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

505.10.1 Requirements Ventilation openings shall be fully covered with listed vents tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1.There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.

2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.

3.The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

~~**505.10.1**~~ **505.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

Add new text as follows:

506.5 Vents Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Add new standard(s) as follows:

ASTM E2886/E2886M: Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

Reason Statement: No evidence exists that coatings are sufficiently durable to be permitted for outdoor use. At present the code is silent on whether fire-retardant coatings can, or not, be used outdoors, except for a prohibition to use them on decks (primarily because of the potential for erosion damage from frequent walking).
A relatively recent study by NIST investigated whether fire retardant coatings applied to wood products were able to continue being effective after being exposed to weather. The study was entitled “Effect of Fire-Retardant Coatings and Weathering on the Flammability of Wood-Based Materials in WUI Communities” and was authored by Laura Dubrulle, Mauro Zammarano, Douglas Fox, Rick Davis, Kathryn Butler, Erik Johnsson and Alexander Maranghides. It was presented at the 2019 BCC Research Conference on May 19-22, 2019, in San Antonio, TX and later published as NIST TN 2094 in 2020 (https://doi.org/10.6028/NIST.TN.2094). It studied 10 fire-retardant coatings (6 film-forming and 4 penetrating stains) and 5 top-coatings (although not necessarily those recommended by the coatings manufacturers specifically for use with their products). The fire properties were assessed by using the cone calorimeter (ASTM E1354, in the horizontal orientation and at 50 kW/m2 initial heat flux) and the wood used was red cedar (with the intent of simulating fences, for example). Weathering was done by exposure to “simulated rainwater” and by UV exposure. The conclusion was that none of the fire-retardant coatings investigated would provide adequate protection, on their own, for more than “a few weeks”. When used together with top-coatings, the protective effect was estimated to last “a few months”.

A durability of a few months is not sufficient to ensure adequate protection, since it is unlikely that homeowners will recoat outdoor products (including any wall materials, eaves, or soffits or even fences).The IBC recognizes fire-retardant treated wood in Chapter 23 and it has a clarifying statement in 2303.2.2 that states: “The use of paints, coating, stains or other surface treatments is not an approved method of protection as required in this section.” That clarification is fully appropriate since a coated wood product is not a product that complies with the requirements of a fire retardant treated wood product, which are clear in section 2303 and which require the product to be “impregnated” with chemical. Clearly, coatings do not impregnate the wood.This means that coated wood panels (i.e. panels with coatings that improve fire performance) are not recognized in the IBC code, other than in existing buildings. It is fully appropriate not to allow the application on site of a paint or coating intended to improved fire performance because such an application in a new building would not ensure a consistent application of a safe product.This proposal would incorporate into the IWUIC coated wood panels but only if they have been factory-produced and have been listed and labeled as having complied with the same fire safety requirements as fire retardant treated wood, including having been tested with the ripped or cut longitudinal gap. This proposal does not introduce any new standards not already in the IWUIC.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Factory produced wood panels will be more expensive than field applied coatings.

FCAC 5.2.4 WUI Vents (6853)

FCAC 5.4.2 Appendix N (6167)

IFC: APPENDIX Chapter 41, SECTION 4101, 4101.1, 4101.1.1, 4101.1.2, 4101.2, 4101.3, SECTION 4102, 4102.1, SECTION 202, SECTION 4103, 4103.1, 4103.2, 4103.3, SECTION 4104, 4104.1, 4104.2, SECTION 4105, 4105.1, 4105.2, 4105.3, 4105.4, 4105.5, 4105.6, SECTION 4106, 4106.1, 4106.2, SECTION 4107, 4107.1, 4107.1.1, 4107.2, 4107.3, 4107.3.1, 4107.3.2, 4107.3.2.1, 4107.3.2.2, 4107.3.2.3, 4107.3.2.4, 4107.3.3, 4107.3.4, 4107.3.4.1, 4107.3.4.2, 4107.3.4.3, 4107.3.5, 4107.4, 4107.5, 4107.5.1, 4107.5.2, 4107.5.3, 4107.5.4, 4107.5.5, 4107.6, SECTION 4108, 4108.1, 4108.2, 4108.3, SECTION N109, N109.1, TABLE N109.1

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

APPENDIX <u>Chapter 41</u>
INDOOR TRADE SHOWS AND EXHIBITIONS

SECTION ~~N101~~ 4101 GENERAL

~~N101.1~~ 4101.1 Scope.
Indoor trade shows and exhibitions with temporary vendor displays or booths within any indoor occupancy classification shall be in accordance with this appendix and all other applicable requirements of this code.

Compliance with this appendix is not required where Section 4001.1.1 ~~N101.1.1~~ or 4001.1.2 ~~N101.1.2~~ is applicable.

~~N101.1.1~~ 4101.1.1 Nonsprinklered buildings.
In a building that is not equipped throughout with an *automatic sprinkler system*, the aggregate exhibit area must be less than 1,500 square feet (139 m^2) of floor area and meet both of the following conditions:

1. The exhibit area does not include any covered or multiple-level exhibits or booths.
2. Not fewer than two remote *exits* or *exit access* doors in compliance with Chapter 10 are provided.

~~N101.1.2~~ 4101.1.2 Sprinklered buildings.
In a building that is equipped throughout with an *automatic sprinkler system* with a minimum design density of ordinary hazard Group 1, the aggregate exhibit area must be less than 4,500 square feet (418 m^2) of floor area and meet both of the following conditions:

1. The exhibit area does not include any covered or multiple-level exhibits or booths.
2. Not fewer than two remote *exits* or *exit access* doors in compliance with Chapter 10 are provided.

~~N101.2~~ 4101.2 Permit required. An operational permit for trade shows and exhibitions shall be required as set forth in Section 105.5.15.

~~N101.3~~ 4101.3 Application.
A permit application for a trade show or exhibition shall be submitted to the *fire code official* prior to the start of the event in a time frame established by the jurisdiction. The application shall include documentation that identifies all of the following:

1. The *means of egress*.
2. The locations and widths of *exits* and *aisles*.
3. The locations of *exit* signs.
4. The total square footage (square meters) of spaces.
5. The location and arrangement of all booths and cooking equipment.
6. The location of all fire protection equipment.
7. The type and location of any heating and electrical equipment, where applicable.
8. The location of any covered or multiple-level booths.
9. *Construction documents* for any covered or multiple-level booths.
10. The storage locations and quantities of any highly combustible goods.
11. The location and type of any vehicle displays, where applicable.

SECTION ~~N102~~ 4102 DEFINITIONS

~~N102.1~~ 4102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

COOKING. Heating food products to a temperature of 145°F (63°C) or higher by baking, braising, boiling, frying or grilling.

COVERED BOOTH. An exhibit that has an obstruction placed over the exhibit above floor level that resembles a roof, canopy, tent or other obstruction, other than vertical signs or banners.

MULTIPLE-LEVEL BOOTH. An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is accessible to the public, or includes a live load above the exhibit area floor level.

Revise as follows:

SECTION ~~N103~~ 4103 PUBLIC SAFETY FOR EVENTS

~~N103.1~~ 4103.1 Fire safety and evacuation plan.
A fire safety and evacuation plan shall be provided in accordance with Section 404.2.

Exception: Where the *fire code official* determines that the nature of the exhibition, display or the activities therein does not pose an increased hazard to public safety.

~~N103.2~~ 4103.2 Fire watch personnel. Where, in the opinion of the *fire code official*, it is essential for public safety in a trade show or exhibition, either because of the number or persons present or because of the nature of the performance, exhibition, display or activity, the *owner* or *owner's* authorized agent shall provide one or more *fire watch* personnel in accordance with Section 403.11.1.

~~N103.3~~ 4103.3 Crowd managers. Where events involve a gathering of more than 1,000 people, trained crowd managers shall be provided in accordance with Section 403.11.3.

SECTION ~~N104~~ 4104 INTERIOR FINISH AND DECORATIVE MATERIALS

~~N104.1~~ 4104.1 General. Interior finish, interior trim, furniture, furnishings and decorative materials, including decorative vegetation, used in exhibition areas shall comply with the requirements of this section and Chapter 8.

~~N104.2~~ 4104.2 Interior wall and ceiling finish.
The materials used for interior wall and ceiling finish of exhibit booths and displays in exhibition areas shall comply with one of the following:

1. Where the building is not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the wall and ceiling finish materials are required to be Class A in accordance with Section 803.
2. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the wall and ceiling finish materials are required to be not less than Class B in accordance with Section 803.

SECTION ~~N105~~ 4105 MULTIPLE-LEVEL BOOTHS

~~N105.1~~ 4105.1 Construction documents. *Construction documents* for all multiple-level booths shall be stamped by a *registered design professional* and shall be submitted with the permit application to the *fire code official* or the *building code official*, as appropriate.

~~N105.2~~ 4105.2 Structural design. Multiple-level booths shall be designed and constructed in accordance with Chapter 16 of the International Building Code.

~~N105.3~~ 4105.3 Means of egress. Upper levels of multiple-level booths with an *occupant load* greater than 10 persons shall have not fewer than two *exits* or *exit access* that are separated in accordance with Section 1007.1.1.

~~N105.4~~ 4105.4 Automatic sprinkler systems. An *approved automatic sprinkler system* in accordance with Section 903.3.1.1 shall be provided in multiple-level booths exceeding 400 square feet (37.2 m^2) in floor area per level.

~~N105.5~~ 4105.5 Inspection. Inspection to verify that multiple-level booths are constructed in accordance with the *construction documents* and structural design details required by this section shall be *approved* by the *building code official*.

~~N105.6~~ 4105.6 Fire alarm and detection. Each multiple-level booth with a floor area exceeding 120 square feet (11.1 m^2) on any level shall be provided with an *approved* fire alarm system in accordance with Section 907.2.

SECTION ~~N106~~ 4106 COVERED BOOTHS

~~N106.1~~ 4106.1 Automatic sprinkler systems. An *approved automatic sprinkler system* in accordance with Section 903.3.1.1 of this code shall be provided in covered booths exceeding 100 square feet (9.3 m^2) in floor area per level.

~~N106.2~~ 4106.2 Fire alarm and detection. Each covered booth with a floor area exceeding 120 square feet (11.1 m^2) on any level shall be provided with an *approved fire alarm system* in accordance with Section 907.2.

SECTION ~~N107~~ 4107 DISPLAY AND STORAGE OF HAZARDOUS AND COMBUSTIBLE MATERIALS

~~N107.1~~ 4107.1 Hazardous materials. The display of hazardous materials shall comply with Section 314 and Chapters 50 through 67. The storage of hazardous materials in indoor trade shows and exhibition areas shall be prohibited.

~~N107.1.1~~ 4107.1.1 Display near exit. The display of hazardous materials within 5 feet (1524 mm) of an *exit* shall be prohibited.

~~N107.2~~ 4107.2 Storage of combustible materials. Storage of combustible materials shall comply with Section 315.

~~**N107.3**~~ **4107.3 Vehicles.** The display of liquid- or gas-fueled vehicles, boats or other motor craft in indoor trade shows and exhibition areas shall comply with Sections 314.4 and 4107.3.1 ~~N107.3.1~~ through 4107.3.3 ~~N107.3.3~~.

~~**N107.3.1**~~ **4107.3.1 Batteries in vehicles.** Vehicle batteries shall be rendered inoperable. Batteries in liquid- and gas-fueled vehicles shall be disconnected. Batteries in electric vehicles shall be rendered inoperable by the removal of fuses or other *approved* methods but shall not be required to be disconnected.

~~**N107.3.2**~~ **4107.3.2 Vehicle fuel.** Vehicle fuel shall comply with Sections 4107.3.2.1 ~~N107.3.2.1~~ through 4107.3.2.4 ~~N107.3.2.4~~.

~~**N107.3.2.1**~~ **4107.3.2.1 Fueling within the structure.** Vehicles shall not be fueled or defueled within the structure.

~~**N107.3.2.2**~~ **4107.3.2.2 Vehicle fuel tanks.** Vehicle fuel tanks shall contain not more than one quarter of the tank capacity or 5 gallons (18.93 L) of fuel, whichever is less.

~~**N107.3.2.3**~~ **4107.3.2.3 Vehicle fuel systems.** Vehicle fuel systems shall be inspected for leaks prior to the vehicle being brought into the structure.

~~**N107.3.2.4**~~ **4107.3.2.4 Vehicle fuel tank openings.** Vehicle fuel tank openings shall be locked and sealed to prevent the escape of vapors.

~~**N107.3.3**~~ **4107.3.3 Obstruction by vehicles.** Vehicles shall not be located in such a manner that they obstruct a *means of egress*.

~~**N107.3.4**~~ **4107.3.4 Gas-powered vehicles.** Compressed natural gas (CNG), liquefied petroleum gas (LPG) or hydrogen-powered vehicles present in indoor trade shows and exhibition areas shall comply with Sections 4107.3.4.1 ~~N107.3.4.1~~ through 4107.3.4.3 ~~N107.3.4.3.~~

~~**N107.3.4.1**~~ **4107.3.4.1 Shutoff valves.** Shutoff valves shall be closed and the engine shall be operated until it stops. Valves shall remain closed until the vehicle is removed.

~~**N107.3.4.2**~~ **4107.3.4.2 Battery hot lead.** The hot lead of the battery shall be disconnected.

~~**N107.3.4.3**~~ **4107.3.4.3 Dual-fuel vehicles equipped to operate on gasoline.** Dual-fuel vehicles equipped to operate on gasoline as well as on CNG, LPG or hydrogen shall comply with Section 3107.15.

~~**N107.3.5**~~ **4107.3.5 Competitions or demonstrations.** Competitions or demonstrations using any type of vehicle shall comply with Section 3107.15.5.

~~**N107.4**~~ **4107.4 Fueled equipment other than vehicles.** Fueled equipment other than vehicles shall comply with Section 313.

~~**N107.5**~~ **4107.5 LP-gas containers.** Liquefied petroleum (LP) gas containers shall comply with Sections 4107.5.1 ~~N107.5.1~~ through 4107.5.5 ~~N107.5.5~~ and Chapter 61.

~~**N107.5.1**~~ **4107.5.1 LP-gas containers exceeding 12 pounds (5 kg) of water capacity.** The use of LP-gas containers exceeding 12 pounds (5 kg) of water capacity shall be prohibited.

~~**N107.5.2**~~ **4107.5.2 Where more than one LP-gas container is present in the same area.** Where more than one LP-gas container is present in the same area, cylinders shall be separated from each other by a minimum of 20 feet (6096 mm).

~~**N107.5.3**~~ **4107.5.3 Equipment for LP-gas containers.** Equipment for LP-gas containers, including tanks, piping, hoses, fittings, valves, tubing and other related components, shall be *approved* and shall comply with Chapter 61 and with the applicable requirements of the International Fuel Gas Code.

~~**N107.5.4**~~ **4107.5.4 Securing of LP-gas containers.** Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

~~**N107.5.5**~~ **4107.5.5 Spare LP-gas containers.** Spare LP-gas containers not connected to an *approved* appliance shall be stored in a location and manner *approved* by the *fire code official*.

~~**N107.6**~~ **4107.6 Cooking and open-flame devices.** All cooking equipment and any open-flame devices shall comply with the requirements of Section 308 of this code and with Chapter 5 of the International Mechanical Code. Cooking equipment shall be separated from combustible material display or storage by a horizontal distance of not less than 5 feet (1524 mm).

SECTION ~~N108~~ 4108 MEANS OF EGRESS

~~**N108.1**~~ **4108.1 Means of egress from the indoor trade show or exhibition area.** *Means of egress* from the

indoor trade show or exhibition area shall comply with Chapter 10 and with Sections 4108.2 ~~N108.2~~ and 4108.3 ~~N108.3.~~

~~N108.2~~ 4108.2 Design of means of egress. The design of *means of egress* shall take into consideration the exhibit layout and the anticipated crowd movement during the event.

~~N108.3~~ 4108.3 Aisles and corridors. *Aisles* and *corridors* within the exhibit area shall be kept free of obstructions when the public is present. Storage of any kind in *aisles* or *corridors* within the exhibit area is not permitted.

Delete without substitution:

~~**SECTION N109 REFERENCED STANDARDS**~~

~~**N109.1 General.**~~
~~See Table N109.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.~~

~~TABLE N109.1~~
~~REFERENCED STANDARDS~~

~~STANDARD ACRONYM~~	~~STANDARD NAME~~	~~SECTIONS HEREIN REFERENCED~~
~~IBC—21~~	~~*International Building Code*~~	~~N105.2~~
~~IFGC—21~~	~~*International Fuel Gas Code*~~	~~N107.5.3~~
~~IMC—21~~	~~*International Mechanical Code*~~	~~N107.6~~

Reason Statement: This appendix, on Trade Shows and Exhibitions, has now been in the code for two cycles and it addresses a specific type of activity that has the potential to create fire safety concerns. For example, the temporary booths that are used during these temporary trade shows can often contain a variety of unregulated materials and there is evidence that the walls of such booths are not typically considered interior finish, but they should be. Also, the use of gas containers without proper regulatory control and the potential presence of vehicles in these trade shows should be addressed in a mandatory fashion. As the code stands, each jurisdiction is entitled, of course, to enforce the appendix, but the application on a consistent basis for all IFC users would be beneficial.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction/compliance because an activity that is potentially unregulated will now require regulation, and some potential testing.

FCAC 5.4.2 Appendix N (6167)

FCAC 5.4.3 (6382)

IFC: 105.5, 105.5.49, [A] 105.6, [A] 105.6.21, [A] 105.6.24, 3103.2, 3103.4, 3105.2, 3105.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.2 through 105.5.52.

Revise as follows:

105.5.49 Temporary membrane structures, special event structures and tents.
An operational permit is required to operate an air-supported temporary membrane structure, a temporary *special event structure* or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains, or extensions attached thereto, when used for funeral services

3. Tents open on all sides, which comply with all of the following:

   ~~2.1.~~ 3.1 Individual tents having a maximum size of 700 square feet (65 m^2).

   ~~2.2.~~ 3.2 The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.

   ~~2.3.~~ 3.3 A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

[A] 105.6 Required construction permits. The *fire code official* is authorized to issue construction permits for work as set forth in Sections 105.6.1 through 105.6.24.

Revise as follows:

[A] 105.6.21 Special event structure. A single construction permit is required to erect and take down a *temporary special event structure* *in accordance with Section 105.5.49*.

[A] 105.6.24 Temporary membrane structures and tents.
A construction permit is required to erect an air-supported temporary membrane structure, a ~~temporary stage canopy~~

temporary special event structure or a tent in accordance with Section 105.5.49 ~~having an area in excess of 400 square feet (37 m^2)~~.

~~**Exceptions:**~~

1. ~~Tents used exclusively for recreational camping purposes.~~
2. ~~Funeral tents and curtains, or extensions attached thereto, when used for funeral services.~~
3. ~~Tents and awnings open on all sides, which comply with all of the following:~~

   3.1. ~~Individual tents shall have a maximum size of 700 square feet (65 m^2).~~

   3.2. ~~The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.~~

   3.3. ~~A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.~~

3103.2 Approval required. *Tents* and *membrane structures* required to have a permit as set forth in Sections 105.5 and 105.6 ~~having an area in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

~~**Exceptions:**~~

1. ~~*Tents* used exclusively for recreational camping purposes.~~
2. ~~*Tents* open on all sides that comply with all of the following:~~

   2.1. ~~Individual *tents* having a maximum size of 700 square feet (65 m^2).~~

   2.2. ~~The aggregate area of multiple *tents* placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m^2) total.~~

   2.3. ~~A minimum clearance of 12 feet (3658 mm) to all structures and other *tents*.~~

Delete without substitution:

~~**3103.4 Permits.**~~
~~Permits shall be required as set forth in Sections 105.5 and 105.6.~~

Revise as follows:

3105.2 Approval. Temporary special event structures required to have a permit as set forth in Sections 105.5 and 105.6 ~~in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining approval and a permit from the *fire code official* and the building official.

Delete without substitution:

~~**3105.3 Permits.**~~
~~Permits shall be required as set forth in Sections 105.5 and 105.6.~~

Reason Statement: The intent of this proposal is to eliminate duplication of code language and consistent use of the defined terms and approach to references. In looking at requirements for temporary membrane structures, temporary special event structures and tents in Permits and Chapter 31 has indicated an inconsistency in terminology. This deletion of text will not change requirements, but instead put the criteria in one location so it will remain consistent over time. This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply an editorial clean up of permit requirements to make the requirements consistent.

FCAC 5.4.3 (6382)

FCAC 5.4.4 Water Filled Vessels (6856)

IFC: 3103.9.1 (New), 3103.6

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

3103.9.1 Water Filled Vessels. Water filled vessels shall not be used to anchor a tent or membrane structure unless approved and in accordance with the tent or membrane structure manufacturer's instructions.

Revise as follows:

3103.6 Construction documents. A detailed site and floor plan for *tents* or *membrane structures* with an *occupant load* of 50 or more shall be provided with each application for approval. The *tent* or *membrane structure* floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment. The *construction documents* shall include an analysis of structural stability. Where water filled vessels are used to anchor a tent or membrane structure, see Section 3103.9.1.

FCAC 5.4.5 Inflatable Amusement Devices (6860)

IFC: SECTION 202 (New), 3101.1, 3106 (New), 3106.1 (New), 3106.2 (New), 3106.3 (New), 3106.4 (New), 3106.5 (New), 3106.6 (New), ASTM Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new definition as follows:

INFLATABLE AMUSEMENT DEVICE. A device made of flexible fabric or other combustible materials that is inflated by one or more air-blowers providing internal air pressure to maintain its shape. Such a device is typically designed for recreational activities that allow occupants to bounce, climb, slide, negotiate an obstacle course or participate in interactive play.

Revise as follows:

3101.1 Scope. *Tents*, temporary special event structures and *membrane structures* shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary *tents* and *membrane structures*. The provisions of Sections 3104 and ~~3106~~ 3107 are applicable to temporary and permanent *tents* and *membrane structures*. The provisions of Section 3105 are applicable to temporary special event structures. . The provisions of Section 3106 are applicable to inflatable amusement devices.The provisions of Section ~~3106~~ 3107 are applicable to outdoor assembly events. Other temporary structures shall comply with the *International Building Code*.

Add new text as follows:

3106 INFLATABLE AMUSEMENT DEVICES

3106.1 Scope. Inflatable amusement devices shall comply with this Section.

Exception: Inflatable amusement devices operated on private property where use is not open to the public.

3106.2 General Inflatable amusement devices shall be designed, anchored, operated and maintained in accordance with the manufacturer's instructions and the requirements of ASTM F2374.

3106.3 Combustible Materials. The materials used in the construction of the inflatable amusement device shall meet the flame propagation criteria of Test Method 2 of NFPA 701. Additionally, a label and affidavit containing the information required in Sections 3104.3 and 3104.4 of this code shall be permanently affixed to the device.

3106.4 Electrical equipment and wiring. Electrical equipment, blower motors and temporary wiring for electrical power or lighting shall comply Section 604.

3106.5 Portable generators. Portable generators shall comply with the applicable provisions of NFPA 70 and with the portable generator requirements of this code.

3106.6 Portable Fire Extinguishers Each generator shall be provided with an approved portable fire extinguisher complying with Section 906 and placed in an approved location.

Add new standard(s) as follows:

F2374: Standard Practice For Design, Manufacture, Operation, And Maintenance Of Inflatable Amusement Devices

FCAC 5.6.1 Valet Trash Appendix (FCAC - Transferred 1/9/21) (6434)

IFC: Appendix O (New), O0 (New), O101 (New), O102 (New), O103 (New), O103.1 (New), O103.2 (New), O103.3 (New), O103.4 (New), O104 (New), O104.1 (New), O104.2 (New), O105 (New), O106 (New), O107 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

Appendix O
Valet Trash and Recycling Collection in Group R-2 Occupancies

O0 *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.*

About this appendix: Appendix O provides for trash and recycle collection services in Group R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.

O101 Scope *Valet trash collection* in Group R-2 Occupancies shall comply with this Appendix.

O102 Definitions VALET TRASH COLLECTION: A service provided whereby trash or recycling is placed outside of dwelling units in approved containers during prescribed times for collection by another party.

O103 Containers Containers used for valet trash collections shall comply with Sections O103.1 through O103.4.

O103.1 Container Integrity Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with tight-fitting lids.

O103.2 Container height Containers shall not exceed 30” in height.

O103.3 Container capacity and limit. Individual containers shall not exceed 2.0 cubic feet (15 gallons) in capacity. Only one trash or recycling container per *dwelling uni* t or *sleeping unit* shall be permitted to be placed outside of the *dwelling unit* or *sleeping unit* at one time. Trash and recycling containers shall not be placed outside of a *dwelling unit* or *sleeping unit* at the same time.

O103.4 Container construction materials Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

O104 Container location. Placement of containers used for *valet trash collection* outside of a *dwelling unit* or *sleeping unit* shall comply with Sections O104.1 and O104.2.

O104.1 Minimum means of egress width Containers used for *valet trash collection* shall not obstruct the minimum required egress width.

O104.2 Stairways Containers used for *valet trash collection* shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an *interior exit stairway.*

O105 Time limits Filled containers used for valet trash or recycling services shall not be placed outside a dwelling unit for more than 6 hours within in any 24-hour period. Empty approved containers used for valet trash or recycling services shall not remain in a corridor for more than 12 continuous hours in a 24 hour period.

O106 Collection rules The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all valet trash collection rules. A copy of the rules shall be provided to the fire code official upon request.

O107 Suspension of service The fire code official has the authority to order the suspension of *valet trash collection* that is not in compliance with this Appendix.

Reason Statement: The use of water filled barrels as anchors has long been problematic. With a great deal of variance in how water filled barrels react based on connections, fill amounts, and connection of straps to the barrel itself, it is the intent of this code proposal to ensure that manufacturers of tents and membrane structures dictate how water barrels may be used to anchor their products, taking a local entity out of the equation.
Tent safety as performed by the tent installer is a very complicated issue and has an enormous number of variables. Many different factors go into proper anchoring of tents and many of those have scientific bases; but because each factor has an influence on the other factors the science can get very confusing.

To give an example of the variables involved, here is a short list

Surface (concrete, dirt, asphalt, grass, other)

Size of tent

Type of stake

Distance from tent of stake

Geometry of staking pattern

Angle of stake/strap

Number of stakes/straps

Stake/Strap connection method

Type of soil

Moisture level in soil

Construction of strapping or rope

Quite often tents are set up on concrete. The ideal method would of installation on concrete are concrete anchors. These anchors are very strong. Depending on the condition and age of the concrete the failure pressure of this type anchor is anywhere from 2000 to 3000 lbs. or more. This is as close to ideal as you are going to get in the tent business.

Unfortunately for several reasons the property owner will not allow drilling and placement of concrete anchors.

"Water Barrels" are commonly used to secure tents. This is the method most often misused.

A typical water barrel holds 50 gallons of water. Water weighs about 8.34 lbs. per gallon. So, the actual weight of a water barrel is about 420 lbs. Not nearly sufficient weight for holding down a large tent. A water barrel has a plastic bottom that tends to slide if pressure is applied. Water barrels are tied at the top, leaving your pressure point about 40" up (should be at absolute ground level). Water barrels also tend to tip over and spill their contents, effectively causing you to lose ballast.

If we have a 40x40 frame tent we will need a minimum of 16,000 lbs. of holding capacity to safely secure this tent in normal conditions. That means in the best of conditions we would need over 60 water barrels to secure one single 40x40 tent.

We can conclude that water barrels are not a good alternative for securing tents. And many municipalities have recognized that and no longer allow the use of water barrels. Safety and liability are the key factors. Most tent and membrane manufactures do not recommend water barrels do to the following reasons: Water barrels have a low coefficient of friction, reduce weight effectiveness to other methods, have a larger quantities of water barrels to other methods, the tie off location affect the amount to uplift that the barrel may withstand.

For those manufacturers who would allow the use of water barrels for anchoring of their tents, a provision has been made to allow for the tent manufacturer to provide the documentation on their use.

For more information and videos please see the link below https://www.gettent.com/content/water-barrels-deadweights.asp

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction will not change since the option to use the water filled vessel is still allowed if approved by the manufacturer.

FCAC 5.6.1 Valet Trash Appendix (FCAC - Transferred 1/9/21) (6434)

FCAC 5.8.1 Fire Protection for Distilleries (6855)

IFC: SECTION 4005, 4005.1, 4005.1 (New), 4005.1.1 (New), 4005.1.2 (New), 4005.1.3 (New), 4005.1.3.1 (New), 4005.1.3.1.1 (New), 4005.1.3.1.2 (New), Table 4005.1.4 (New), 4005.1.3.1.3 (New), 4005.1.4 (New), 4005.1.4.1 (New), 4005.1.4.2 (New), 4005.1.4.3 (New), 4005.1.4.4 (New), 4005.1.4.5 (New), 4005.1.4.6 (New), Table 4005.1.4.6.3 (New), 4005.1.4.6.1 (New), 4005.1.4.6.2 (New), 4005.1.4.6.3 (New), 4005.2 (New), 4005.2.1 (New), 4005.2.1.1 (New), 4005.2.2 (New), 4005.2.3 (New), 4005.2.3.1 (New), 4005.2.3.2 (New), 4005.2.3.6 (New), 4005.2.3.3 (New), 4005.2.3.4 (New), 4005.2.3.5 (New), Table 4005.2.3.6 (New), Figure 4005.2.3.6(1) (New), FIGURE 4005.2.3.6(2) (New), FIGURE 4005.2.3.6(6) (New), FIGURE 4005.2.3.6(3) (New), , FIGURE 4005.2.3.6(4) (New), FIGURE 4005.2.3.6(5) (New), 4005.3 (New); IBC: 306.2, 311.2, 306.3, 311.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2021 International Fire Code

SECTION 4005 FIRE PROTECTION

Delete without substitution:

~~**4005.1 Automatic sprinkler system.**~~
~~The storage of distilled spirits and wines shall be protected by an *approved automatic sprinkler system* as required by Chapter 9.~~

Add new text as follows:

4005.1 Palletized storage of distilled spirits in wooden barrels. The palletized storage of distilled spirits shall be protected by an *approved automatic sprinkler system* installed throughout the building in accordance with Section 903.3.1.1

as modified in this section.

4005.1.1 Storage height. Palletized storage arrays of barrels stored on-end shall be limited to a maximum of 7 pallets high.

4005.1.2 Flue spaces. Flue spaces with a minimum width of 6 inches (152 mm) shall be maintained between adjacent pallets.

4005.1.3 Loading aisles. Palletized storage that is provided with a defined loading aisle between pallet storage areas shall be arranged using one of the following:

1. Draft curtains, installed in accordance with Section 4005.1.3.1, shall be provided along the side of palletized storage facing the loading aisle to separate the quick response sprinklers and standard response sprinklers.
2. A trench drain shall be provided on each side of the loading aisle, arranged to capture any spilled distilled spirits in the aisle space and remove them from the building to prevent spills from spreading into the barrel storage area.
3. Barrels shall be banded on each pallet to prevent barrels from falling off pallets during transportation and loading into the storage racks.

4005.1.3.1 Draft curtains. Where installed in accordance with Section 4005.1.3, Item 1, draft curtains shall be designed and construction in accordance with Sections 4005.1.3.1.1 through 4005.1.3.1.3.

4005.1.3.1.1 Construction. Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved noncombustible materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be designed to resist the passage of smoke.

4005.1.3.1.2 Location. Draft curtains shall be located along loading aisles serving storage areas.

Table 4005.1.4
Palletized Storage of Distilled Spirits with up to 75% Alcohol by Volume in Wooden Barrels

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Ceiling Sprinkler Protection		
				Response / Nominal Temperature Rating / Orientation	K-factor gpm/psi$^{1/2}$	Design[a], # of Sprinklers @ Pressure (psi)
Barrel Storage	Wet-pipe	30	24 feet or 7 barrels	QR / 165ºF / Pendent	14.0	12 @ 18
	Dry-pipe			SR / 286ºF / Upright	16.8	24 @ 13
	Wet-pipe	30	1 barrel	Any / 165ºF / Any	11.2	30 @ 7
	Dry-pipe			SR / 286ºF / Upright	11.2	50 @ 7
	Wet-pipe	30	2 barrels	SR / 286ºF / Any	11.2	50 @ 29
Loading Aisle w/ Draft Curtain	Wet-pipe or Dry-pipe	30	NA	SR / 286ºF / Any	5.6	100 @ 13
					> 8.0	100 @ 7
Loading Aisle w/ Trench Drains or Banded Barrels or No Permanent Loading Aisle	Provide the barrel storage design across the entire roof area (i.e., storage area and loading aisle)					

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8.

Notes: QR = quick response sprinkler; SR = standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

4005.1.3.1.3 Depth. Draft curtains shall extend vertically downward from the ceiling for a minimum distance of 20 percent of the ceiling height measured from the floor, with a minimum depth of 6 feet (1829 mm).

4005.1.4 Automatic sprinkler system design. Storage heights and automatic sprinkler densities for palletized on-end barrels shall in accordance with Table 4005.1.4 and Sections 4005.1.4.1 through 4005.1.4.6.

4005.1.4.1 Protected product. The storage and automatic sprinkler requirements in Table 4005.1.4 apply to alcohol-water mixtures greater than 20 percent and up to 75 percent alcohol by volume in wooden barrel sizes not exceeding 130 gallons (492 L).

4005.1.4.2 Hose stream allowance. The automatic sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.1.4.3 Water supply duration. The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.1.4.4 Automatic sprinkler system balancing. Where a permanent loading aisle is provided with a separate automatic sprinkler system on the ceiling, the barrel storage automatic sprinkler design and the loading aisle automatic sprinkler design are not required to be balanced at the point of connection.

4005.1.4.5 Dry pipe sprinkler systems. Where dry-pipe sprinkler systems are installed, the sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.1.4.6 Small distilled spirits facilities. Fire protection for palletized storage of distilled spirits in small distilled spirits facilities not greater than 7,500 square feet (697 m²) is permitted to be in accordance with Sections 4005.1.4.6.1 through 4005.1.4.6.3.

Table 4005.1.4.6.3
Palletized Storage of Distilled Spirits in Wooden Barrels in Small Distilled Spirits Facilities

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height (feet)	Ceiling Sprinkler Protection			
				Response / Temperature Rating / Orientation	K-factor ($gpm/psi^{1/2}$)	Sprinkler Density (gpm/ft^2)	Area (square feet)
Barrel Storage	Wet-pipe	24	12	SR / 286ºF / Any	≥ 11.2	0.35	4000
				SR / 165ºF / Any	≥ 11.2	0.35	7500

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: SR = standard response sprinkler.

4005.1.4.6.1 Ceiling clearance The clearance from the top of storage to the deflector of the automatic sprinklers at the ceiling shall be a minimum of 18 inches (457 mm) and a maximum of 10 feet (3048 mm).

4005.1.4.6.2 Automatic sprinkler coverage area. The automatic sprinkler coverage area shall not exceed 80 square feet (7.4 m2) per sprinkler.

4005.1.4.6.3 Fire protection scheme. The storage arrangement and automatic sprinkler system design shall be in accordance with Table 4005.1.4.6.3.

4005.2 Rack storage in wooden barrels. The rack storage of distilled spirits and wine greater than 20 percent alcohol shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 and Sections 4005.2.1 through 4005.2.3.5.2.

4005.2.1 Flues spaces for on-side wooden barrels. Rack storage for on-side wooden barrels shall be provided with a minimum width of 8 inches (203 mm) between adjacent rows of barrels.

4005.2.1.1 Elevated walkways. Where provided, elevated walkways between barrels shall be constructed in accordance with one of the following:

1. Noncombustible materials that are 50 percent open.
2. Noncombustible materials that are open less than 50 percent provided the walkway has a maximum width of 1 foot (0.3 m) and a minimum gap of 3 inches (76 mm) is provided between the walkway and the barrel storage.
3. Combustible materials and provided with a row of automatic sprinklers directly beneath each walkway.

4005.2.2 Flues spaces for on-end wooden barrels Rack storage arrangements with on-end wooden barrels shall be provided with transverse and longitudinal flue spaces with a minimum width of 6 inches (15 cm).

4005.2.3 Fire protection for rack storage. Rack storage arrangements of alcohol-water mixtures up to 75 percent alcohol in wooden barrel with sizes not exceeding 130 gallons (492 L) shall be protected in accordance with Sections 4005.2.3.1 through 4005.2.3.5.2.

4005.2.3.1 Hose stream allowance. The automatic sprinkler system design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.2.3.2 Water supply duration. The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.2.3.6 Automatic sprinkler system design. The design of the automatic sprinkler system at the ceiling and the in-rack sprinkler system shall be in accordance with Table 4005.2.3.6.

4005.2.3.3 Dry-pipe automatic sprinkler system. Where dry-pipe automatic sprinkler systems are installed, the automatic sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.2.3.4 Ceiling automatic sprinkler systems. The automatic sprinkler systems installed at the ceiling shall be designed with a minimum density of 0.2 gallons per minute per square foot (0.8 L/min) with an operating area of 2,000 square feet (186 m2).

4005.2.3.5 Automatic sprinkler system balancing. The automatic sprinkler system installed at the ceiling and the in-rack sprinkler system shall be balanced at the point of connection.

Table 4005.2.3.6
Rack Storage of Distilled Spirits in Wooden Barrels

Barrel Arrangement	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Minimum Aisle Width (feet)	Ceiling Sprinkler Protection			In-Rack Sprinkler	
					Response / Nominal Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Design, # of Sprinklers @ Pressure (psi)	Layout	Res Non Tem Rati
On-Side	Wet	40	33 feet / 9 barrels	NA	QR / 165ºF / Pendent	14.0	12 @ 37	None	
					SR / 286ºF / Any	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / Any
	Dry	40	33 feet / 9 barrels	NA	SR / 286ºF / Upright	16.8	24 @ 25	None	
					SR / 286ºF / Upright	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / Upri
On-End	Wet	30	25 feet / 5 barrels	8	SR / 286ºF / Any	≥ 11.2	50 @ 7	Figures 4005.2.3.6(3), 4005.2.3.6(4), 4005.2.3.6(5) and 4005.2.3.6(6)	QR / Any

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

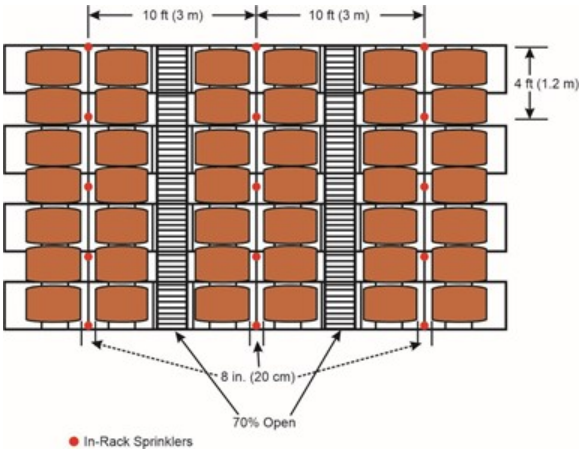


Figure 4005.2.3.6(1)
In-rack sprinkler layout for wooden barrels on their sides (plan view)

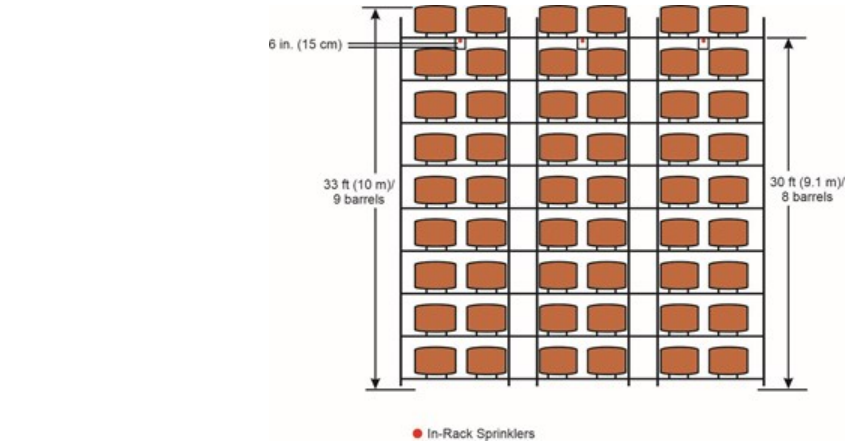


FIGURE 4005.2.3.6(2)

IN-RACK SPRINKLER LAYOUT FOR WOODEN BARRELS ON THEIR SIDES (ELEVATION VIEW)

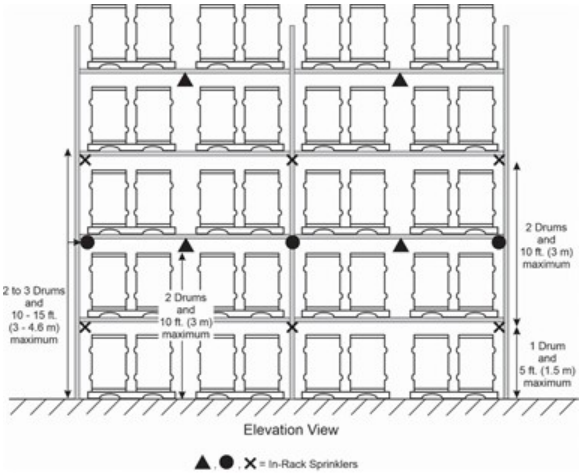


FIGURE 4005.2.3.6(6)
IN-RACK SPRINKLER LAYOUT FOR MULTIPLE ROW RACK OF ON-END WOODEN BARRELS

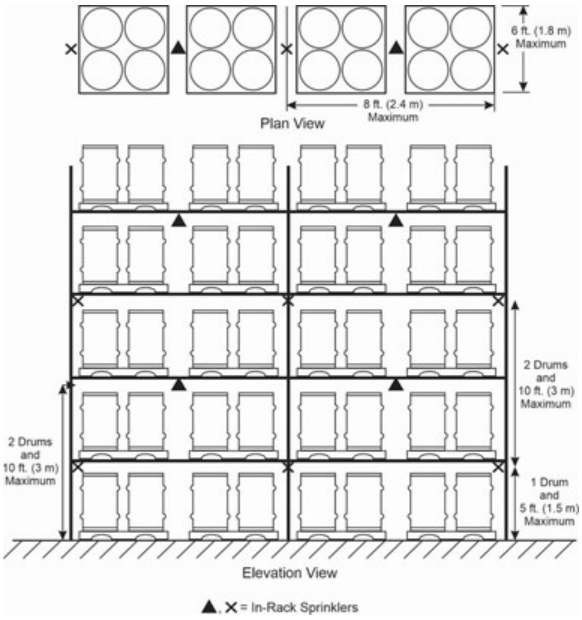


FIGURE 4005.2.3.6(3)
IN-RACK SPRINKLER LAYOUT FOR SINGLE ROW RACK OF ON-END WOODEN BARRELS

Revise as follows:

~~4005.2~~ 4005.4 Portable fire extinguishers. *Approved* portable fire extinguishers shall be provided in accordance with Section 906.

Add new text as follows:

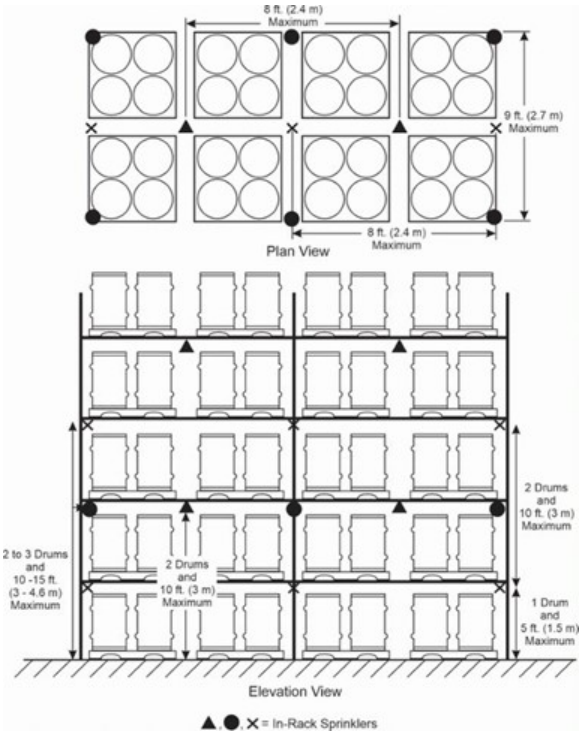


FIGURE 4005.2.3.6(4)
IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

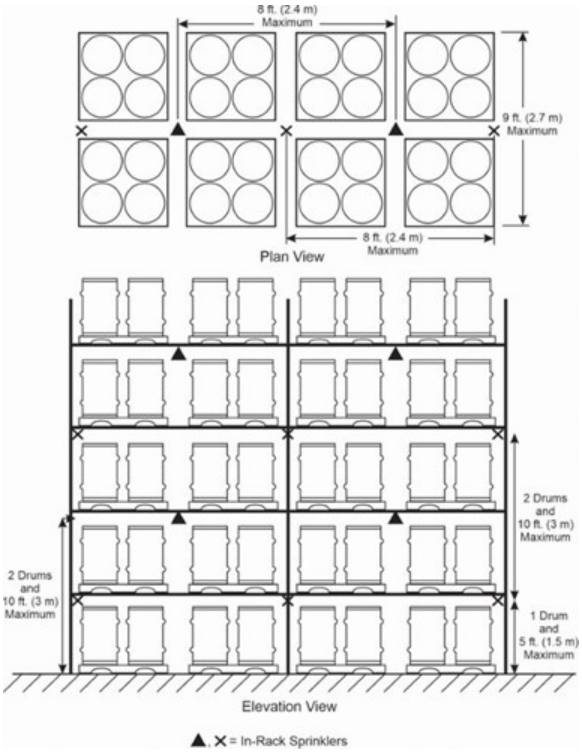


FIGURE 4005.2.3.6(5)
IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

Revise as follows:

4005.3 Wine 20 percent or less alcohol content. The storage of wine in barrels with an alcohol content of 20 percent or less shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1.

2021 International Building Code

Revise as follows:

306.2 Moderate-hazard factory industrial, Group F-1.
Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over ~~16 percent~~ 20 percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)

- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

311.2 Moderate-hazard storage, Group S-1.
Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over ~~16-percent~~ 20 percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps

- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

306.3 Low-hazard factory industrial, Group F-2.
Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including ~~16-percent~~ 20 percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

311.3 Low-hazard storage, Group S-2.
Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including ~~16-percent~~ 20 percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Reason Statement: This proposal provides guidance for storage and associated fire protection of alcoholic beverages both in warehouse and in small distillery facilities.
One of the conceptual changes is the threshold at which the percentage of alcohol results in a higher classification of hazard. Traditionally, beverages with an alcohol content greater than 16% were considered to present a higher level of hazard and were therefore placed into Group F-1 for manufacturing and packaging and Group S-1 for storage. Recent testing by FM Global demonstrates that the 16% threshold was too conservative and the threshold is being revised to 20%. Even recent revisions to Ch 32 list beverages in glass or ceramic containers with up to 20% alcohol content as a Class I commodity. The alcohol content does not raise the flammability of the liquid to an extent where additional levels of protection are necessary, and for the most part can be considered nonflammable or noncombustible. As a result, the manufacturing, packaging and storage of beverages with an alcohol content up to 20% will be classified as Group F-2 or S-2 as appropriate. This results in revisions to IBC Chapter 3 and the IFC occupancy definitions in Chapter 2.

The fire protection section provides specific sprinkler system design criteria. The requirements are based on the storage configuration:

- Palletized storage in Section 4005.1
- Rack storage in Section 4005.2

Palletized storage is then provided with design options in Section 4005.1.3:

- Provide draft curtains along the loading aisles
- Provide trench drains along each side of the loading aisles
- Provide straps to secure the barrels to the pallet
- There is a 4th option, which is to not provide a loading aisle at all. As stated in the charging sentence “palletized storage provided with a defined loading aisle…” In other words, the building or room is solid storage; it will have walkways to access the barrels but will not have a forklift loading aisle.

Each of these three designs provides a method of mitigating the spread of liquid or fire during a fire incident. These three protection features are again reference in Table 4005.1.4, and have an impact on the fire sprinkler system design.

The fire sprinkler design criteria is core of this code change. Table 4005.1.4 provides criteria for sprinkler system densities, storage heights and sprinkler selection. This design criteria is based on full-scale fire testing conducted by FM Global and presented in FM Data Sheet 7-29.

Section 4005.1.4 provides for a reduced level of sprinkler protection. Because of reduced level of protection, this section is limited to facilities no greater than 7,500 square feet and with a ceiling height of no more than 24 feet. The intent of this reduction is to allow the small distilleries with a reasonable level of protection based on the reduced fire load per square foot and limited size.

Rack storage is covered in Section 4005.2. This section contains specific requirements again based on storage method:

- Barrels stored on their side
- Barrels stored on-end

The difference in configuration results in different sprinkler design criteria in Table 4005.2.3.6. Rack storage is allowed up to 33 feet in height. Figures have been included to depict the in-rack sprinkler locations.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were

also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Bibliography: FM Global Property Loss Prevention Data Sheet 7-29, Ignitable Liquid Storage in Portable Containers, October 2020
Factory Mutual Insurance Company, Johnson, RI

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Chapter 40 of the Fire Code already requires an approved fire sprinkler system for new distilleries and storage facilities for distilled spirits. This code change does not increase that requirement but will provide guidance and consistency in how jurisdictions apply the fire sprinkler requirement.

FCAC 6.1.1 Hazmat location limits (6286)

IFC: 5704.2.9.6.1, 5706.2.4.4, 5806.2, 6104.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5704.2.9.6.1 Locations where above-ground tanks are prohibited. Storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

5706.2.4.4 Locations where above-ground tanks are prohibited. The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

5806.2 Limitations. Storage of flammable *cryogenic fluids* in stationary containers outside of buildings is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

6104.2 Maximum capacity within established limits. Storage of liquified petroluem gas, for the protection of heavily populated or congested areas, shall not exceed an aggregate capacity in any one installation of 2,000 gallons (7570 L) within the limits established by law ~~restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L) [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction [see "Adoption "on Page vii].

Exception:
In particular installations, this capacity limit shall be determined by the *fire code official*, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.

FCAC 6.1.3 (a) Flammable Gas Definition (6040)

IFC: SECTION 202; IBC: SECTION 202

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

FLAMMABLE GAS. A material which is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)] ~~which~~ subdivided as follows:

1. ~~Is~~ Category 1A. (a) a gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or
2. ~~Has~~ (b) A gas with a flammable range at 14.7 psia (101 kPa) with air of not less than 12 percent, regardless of the lower limit.

unless data shows compliance with Category 1B.

Category 1B. A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one of more of the following:

(a) a lower flammablity limit of more than 6% by volume of air; or

(b) a fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

2021 International Building Code

Revise as follows:

[F] FLAMMABLE GAS. A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)], ~~which also meets one of the following~~ subdivided as follows:

1. ~~Is~~ Category 1A. (a) A gas which is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air.
2. ~~Has~~ (b) A gas with a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit.

unless data shows compliance with Category 1B.

Category 1B. A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one or more of the following:

(a) a lower flammability limit of more than 6% by volume in air; or

(b) a fundamental burning velocity of less than 3.9 in/s (10 cm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

FCAC 6.1.3 (b) Flammable Gas MAQ (6059)

IFC: TABLE 5003.1.1(1), TABLE 5003.1.1(3), 5003.8.3.5, 5003.8.3.5.4 (New), 5003.11, 5003.11.1 , 5003.11.2, 5003.11.1.1, 5003.11.1.1.1, 5003.11.1.1.2, 5003.11.1.1.3, 5003.11.1.1.4, 5003.11.1.1.5, 5003.11.1.1.6, 5003.11.1.1.7, 5003.11.1.1.8, 5003.11.1.1.9, 5003.11.1.1.10, 5003.11.1.1.11, 5003.11.2 (New), 5003.11.2.1 (New); IBC: TABLE 307.1(1), [F] 414.2.5, 414.2.5.4 (New), 414.2.5(3) (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 5003.1.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Flammable gas	Gaseous	H-2	NA			NA	NA		NA	NA
	1A and 1B (High BV)[r]			NA	1,000[d, e]			1,000[d,e]		
	1B (Low BV)[r]				162,500[d,e]			162,500[d,e]		
	Liquefied				NA			NA		
	1A and 1B (High BV)[r]			(150)[d, e]			(150)[d, e]			
	1B (Low BV)[r]			(10,000)[d,e]			(10,000)[d,e]			

r "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

TABLE 5003.1.1(3)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, d]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
		Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]
Flammable gas	Gaseous	Not Applicable	Not Applicable		Not Applicable	Not Applicable		Not Applicable	Not Applicable
	1A and 1B (High BV)[e]			3,000			1,500		
	1B (Low BV)[e]			195,000			97,500		
	Liquefied								
	1A and 1B (High BV)[e]		(300)	Not Applicable		(150)	Not Applicable		
	1B (Low BV)[e]		(20,000)			(10,000)			

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.

e. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.8.3.5 Hazardous materials in Group M display and storage areas and in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 5003.8.3.5.1 through ~~5003.8.3.5.3~~ 5003.8.3.5.4.

Add new text as follows:

5003.8.3.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, or in an outdoor control area, or stored in a single control area of a Group S occupancy is allowed to exceed the maximum allowable quantities per control area specified in Table 5003.1.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with Section 5003.11.2.

Revise as follows:

5003.11 Maximum allowable quantity for Group M storage and display and Group S storage. The aggregate quantity of ~~nonflammable solid and nonflammable or noncombustible liquid~~ hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor *control area*, or stored in a single *control area* of a Group S occupancy, is allowed to exceed the *maximum allowable quantity per control area* indicated in Section 5003.1 where in accordance with Sections 5003.11.1 and 5003.11.2 ~~through 5003.11.3.11~~.

5003.11.1 Nonflammable solid and nonflammable or noncombustible liquid hazardous materials ~~Maximum allowable quantity per outdoor control area in Group M or S occupancies.~~ The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *control area* of a Group M occupancy , or an outdoor control area, or stored in a single *control area* of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.1.

Delete without substitution:

~~**5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies.**~~
~~The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *outdoor control area* of a Group M occupancy shall not exceed the amounts set forth in Table 5003.11.1.~~

Revise as follows:

~~**5003.11.3**~~ **5003.11.1.1 Storage and display.** Storage and display shall be in accordance with Sections ~~5003.11.3.1~~ 5003.1.1.1 through ~~5003.11.3.11~~ 5003.11. 1.1.11 .

~~**5003.11.3.1**~~ **5003.11.1.1.1 Density.** Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m^2) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m^2) of floor area actually occupied by liquid merchandise.

~~**5003.11.3.2**~~ **5003.11.1.1.2 Storage and display height.** Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

~~**5003.11.3.3**~~ **5003.11.1.1.3 Container location.** Individual containers less than 5 gallons (19 L) or less than 25 pounds (11 kg) shall be stored or displayed on pallets, racks or shelves.

~~**5003.11.3.4**~~ **5003.11.1.1.4 Racks and shelves.** Racks and shelves used for storage or display shall be in accordance with Section 5003.9.9.

~~**5003.11.3.5**~~ **5003.11.1.1.5 Container type.** Containers shall be *approved* for the intended use and identified as to their content.

~~**5003.11.3.6**~~ **5003.11.1.1.6 Container size.** Individual containers shall not exceed 100 pounds (45 kg) for solids or 10 gallons (38 L) for liquids in storage and display areas.

~~**5003.11.3.7**~~ **5003.11.1.1.7 Incompatible materials.** *Incompatible materials* shall be separated in accordance with Section 5003.9.8.

~~**5003.11.3.8**~~ **5003.11.1.1.8 Floors.** Floors shall be in accordance with Section 5004.12.

~~**5003.11.3.9**~~ **5003.11.1.1.9 Aisles.** Aisles 4 feet (1219 mm) in width shall be maintained on three sides of the storage or display area.

~~**5003.11.3.10**~~ **5003.11.1.1.10 Signs.** Hazard identification signs shall be provided in accordance with Section 5003.5.

~~**5003.11.3.11**~~ **5003.11.1.1.11 Storage plan.** A storage plan illustrating the intended storage arrangement, including the location and dimensions of aisles, and storage racks shall be provided.

Add new text as follows:

5003.11.2 Category 1B flammable gas with low burning velocity. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single *control area* of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.2.

5003.11.2

MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
	Sprinklered in accordance with Note b	Nonsprinklered
Category 1B (Low BV)[d]		
Gaseous	390,000 cu. ft.	195,000 cu. ft
Liquefied	40,000 lbs.[c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m3

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.11.2.1 Fire protection and storage arrangements. Fire protection and container storage arrangements for quantities of Category 1B flammable gases permitted by Table 5003.11.2 shall be in accordance with the all of the following:

1. Storage of the Category 1B flammable gases on shelves shall not exceed 6 feet (1829 mm) in height, and shelving shall be metal.
2. Rack storage, pallet storage or piles of the Category 1B flammable gas greater than 6 feet 6 inches (1981 mm) in height shall be provided with an automatic sprinkler system with a minimum design of Extra Hazard Group 1.
3. Combustible commodities shall not be stored above the Category 1B flammable gases.
4. Flammable liquids shall be separated from the Category 1B flammable gases by a distance 20 feet (6096 mm). The separation is permitted to be reduced to 10 feet (3048 mm) where secondary containment or diking is provided to retain a flammable liquid spill at a distance of 10 feet (3048 mm) from the Category 1B flammable gas storage.

2021 International Building Code

Revise as follows:

TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-O
			Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Sol pounds fee
Flammable gas	Gaseous	H-2	NA	NA		NA	NA		NA
	1A and 1B(High BV)[r]				1,000[d,e]			1,000[d,e]	
	1B (Low BV)[r]				162,500[d,e]			162,500[d,e]	
	Liquefied				NA			NA	
	1A and 1B(High BV)[r]			(150)[d,e]			(150)[d,e]		
	1B (Low BV)[r]			(10,000)[d,e]			(10,000)[d,e]		

r. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10 cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

[F] 414.2.5 Hazardous material in Group M display and storage areas and in Group S storage areas. *Hazardous materials* located in Group M and Group S occupancies shall be in accordance with Sections 414.2.5.1 through ~~414.2.5.3~~ 414.2.5.4.

Add new text as follows:

414.2.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single *control area* of a Group M occupancy or stored in a single *control area* of a Group S occupancy is allowed to exceed the *maximum allowable quantities per control area* specified in Table 307.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with the *International Fire Code* and quantities do not exceed the amounts specified in Table 414.2.5(3).

414.2.5(3)

MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
	Sprinklered in Accordance with Note b	Nonsprinklered
Category 1B (Low BV)[e]		
Gaseous	390,000 cu. ft.	195,000 cu. ft.
Liquefied	40,000 lbs.[c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m3

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

FCAC 6.1.3 (d) Flammable Gas Coordination of Code with Definition Change (6058)

IFC: TABLE 911.1, 3307.2.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 911.1

EXPLOSION CONTROL REQUIREMENTS[f]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems**
Hazard Category			
Flammable gas	Gaseous	Not required	Required[h]
	Liquefied	Not required	Required[h]

h. Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

3307.2.1 Pipe cleaning and purging.
The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. Compressed gas piping systems other than fuel gas piping systems where in accordance with Chapter 53.
2. Piping systems regulated by the *International Fuel Gas Code*.
3. Liquefied petroleum gas systems in accordance with Chapter 61.
4. Cleaning and purging of refrigerant piping systems shall comply with the International Mechanical Code.

FCAC 6.1.4 Oxidizer classification (6055)

IFC: E102.1.7, E102.1.7.2 (New), E102.1.7.1, TABLE E102.1.7.2 (New), TABLE E104.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E102.1.7 Oxidizers. Examples include:

1. Gases: oxygen, ozone, oxides of nitrogen, fluorine and chlorine (reaction with flammables is similar to that of oxygen).
2. Liquids: bromine, hydrogen peroxide, nitric acid, perchloric acid, sulfuric acid.
3. Solids: chlorates, chromates, chromic acid, iodine, nitrates, nitrites, perchlorates, peroxides.

Add new text as follows:

E102.1.7.2 Oxidizer classification. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the classifications available in product safety data sheets. For the classification of solid and liquid oxidizers, GHS relies on relevant quantitative test data that measures burning rate, a key indicator of the severity of the hazard.

To assist code officials, an alignment between the GHS and IFC oxidizer hazard classes is provided in Table E102.1.7.2. This alignment is provided as a tool to assist fire code officials and should not be used as the sole means for hazardous materials classification.

E102.1.7.1 Examples of liquid and solid oxidizers according to hazard.
Examples include:

Class 4: ammonium perchlorate (particle size greater than 15 microns), ammonium permanganate, guanidine nitrate, hydrogen peroxide solutions more than 91 percent by weight, perchloric acid solutions more than 72.5 percent by weight, potassium superoxide, tetranitromethane.

Class 3: ammonium dichromate, calcium hypochlorite (over 50 percent by weight), chloric acid (10 percent maximum concentration), hydrogen peroxide solutions (greater than 52 percent up to 91 percent), mono-(trichloro)-tetra-(monopotassium dichloro)-penta-s-triazinetrione, nitric acid, (fuming—more than 86 percent concentration), perchloric acid solutions (60 percent to 72 percent by weight), potassium bromate, potassium chlorate, potassium dichloro-s-triazinetrione (potassium dichloro-isocyanurate), potassium perchlorate (99 percent), potassium permanganate (greater than 97.5 percent), sodium bromate, sodium chlorate and sodium chlorite (over 40 percent by weight).

Class 2: barium bromate, barium chlorate, barium hypochlorite, barium perchlorate, barium permanganate, 1-bromo-3-chloro-5, 5-dimethylhydantoin, calcium chlorate, calcium chlorite, calcium hypochlorite (50 percent or less by weight), calcium perchlorate, calcium permanganate, calcium peroxide (75 percent), chromium trioxide (chromic acid), copper chlorate, halane (1, 3-dichloro-5, 5-dimethylhydantoin), hydrogen peroxide (greater than 27.5 percent up to 52 percent), lead perchlorate, lithium chlorate, lithium hypochlorite (more than 39 percent available chlorine), lithium perchlorate, magnesium bromate, magnesium chlorate, magnesium perchlorate, mercurous chlorate, nitric acid (more than 40 percent but less than 86 percent), perchloric acid solutions (more than 50 percent but less than 60 percent), potassium peroxide, potassium superoxide, silver peroxide, sodium chlorite (40 percent or less by weight), sodium dichloro-s-triazinetrione anhydrous (sodium dichloroisocyanurate anhydrous), sodium perchlorate, sodium perchlorate monohydrate, sodium permanganate, sodium peroxide, sodium persulfate (99 percent), strontium chlorate, strontium perchlorate, thallium chlorate, urea hydrogen peroxide, zinc bromate, zinc chlorate and zinc permanganate.

Class 1: all inorganic nitrates (unless otherwise classified), all inorganic nitrites (unless otherwise classified), ammonium persulfate, barium peroxide, hydrogen peroxide solutions (greater than 8 percent up to 27.5 percent), lead dioxide, lithium hypochlorite (39 percent or less available chlorine), lithium peroxide, magnesium peroxide, manganese dioxide, nitric acid (40 percent concentration or less), perchloric acid solutions (less than 50 percent by weight), potassium dichromate, potassium monopersulfate (45 percent $KHSO_5$ or 90 percent triple salt), potassium percarbonate, potassium persulfate, sodium carbonate peroxide, sodium dichloro-s-triazinetrione dihydrate, sodium dichromate, sodium perborate (anhydrous),

sodium perborate monohydrate, sodium perborate tetra-hydrate, sodium percarbonate, strontium peroxide, trichloro-s-triazinetrione (trichloroisocyanuric acid) and zinc peroxide.

Add new text as follows:

TABLE E102.1.7.2
Oxidizer comparison (IFC vs. GHS)

IFC Hazard Class	GHS Hazard Category
Oxidizer, Class 4	H271, Category 1
Oxidizer, Class 3	H271, Category 1
Oxidizer, Class 2	H272, Category 2
Oxidizer, Class 1	H272, Category 3

Revise as follows:

TABLE E104.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
CGA P-20—2009	*Standard for Classification of Toxic Mixtures*	E103.1.3.1
CGA P-23—2008	*Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components*	E102.1.2
UN (Rev.7, 2017)	UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14	E102.1.7.2

FCAC 6.1.5 (a) & (b) Appendix E: IFC-GHS comparison (6124)

IFC: E103.2, SECTION E104 (New), E104.1 (New), E104.2 (New), TABLE E104.2 (New), SECTION E105

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E103.2 Evaluation questions.
The following are sample evaluation questions:

1. What is the material? Correct identification is important; exact spelling is vital. Checking labels and SDS and asking responsible persons should be among the highest priorities.
2. What are the concentration and strength?
3. What is the physical form of the material? Liquids, gases and finely divided solids have differing requirements for spill and leak control and containment.
4. How much material is present? Consider in relation to permit amounts, *maximum allowable quantity per control area* (from Group H occupancy requirements), amounts that require detached storage and overall magnitude of the hazard.
5. What other materials (including furniture, equipment and building components) are close enough to interact with the material?
6. What are the likely reactions?
7. What is the activity involving the material?
8. How does the activity impact the hazardous characteristics of the material? Consider vapors released or hazards otherwise exposed.
9. What must the material be protected from? (For example, other materials, temperature, shock, pressure.)
10. What effects of the material must people and the environment be protected from?
11. How can protection be accomplished? Consider:

    11.1. Proper containers and equipment.

    11.2. Separation by distance or construction.

    11.3. Enclosure in cabinets or rooms.

    11.4. Spill control, drainage and containment.

    11.5. Control system ventilation, special electrical, detection and alarm, extinguishment, explosion venting, limit controls, exhaust scrubbers and excess flow control.

    11.6. Administrative (operational) control signs, ignition source control, security, personnel training, established procedures, storage plans and emergency plans.

Evaluation of the hazard is a strongly subjective process; therefore, the person charged with this responsibility must gather as much relevant data as possible so that the decision will be objective and within the limits prescribed in laws, policies and standards.

It could be necessary to cause the responsible persons in charge to have tests made by qualified persons or testing laboratories to support contentions that a particular material or process is or is not hazardous. See Section 104.8.2

Add new text as follows:

SECTION E104
GHS HAZARDOUS MATERIALS DEFINITIONS CONTENT

E104.1 Hazardous materials definitions. The categorization and classification of hazardous materials enables the code user to determine the applicability of requirements based on hazard category and class related to the physical and health hazards of materials. The current definitions found in Chapter 2 have been developed using criteria found in NFPA

codes and standards, model fire prevention codes, NIOSH, requirements of the U.S. DOT, and by U.S. OSHA.

The chemical industry has grown substantially since the inception of the IFC hazard definitions. Large-scale global production and distribution of common and specialty chemicals has become mainstream. In the 1990s, the United Nations (UN) developed the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to create international congruency among chemical suppliers. The GHS is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials.

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) published a revised Hazard Communication Standard (29 CFR 1910.1200) to align with the GHS in March 2012. It became effective in May 2012. All manufacturers selling, producing or transporting chemicals in the United States are now required to comply with the GHS and provide this standardized hazard information on all Safety Data Sheets (SDSs).

Safety Data Sheets are a primary source of information for identifying hazards for chemicals and mixtures containing hazardous materials. It can be helpful for fire code officials to become familiar with the GHS definitions and how they relate to IFC hazard definitions.

E104.2 GHS Hazardous Materials Definitions Comparison Table Table E104.2 provides a tabular presentation of the various definitions published within the International Fire Code. In addition, the table presents corresponding definitions, where available, from the 2012 edition of the Hazard Communication Standard developed by the Occupational Health and Safety Administration (OSHA) along with applicable hazard statement codes. OSHA's 2012 Hazard Communication Standard aligns with the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The Table is not meant to imply perfect alignment between IFC and GHS definitions.

TABLE E104.2
IFC AND GHS HAZARD DEFINITION COMPARISON

IFC MATERIAL	IFC CLASS	IFC DEFINITION	GHS 2017 (REV 7) CLASSIFICATION (H-CODE AND CATEGORY); HAZARD STATEMENT;DEFINITION
Aerosol		A combination of a container, a propellant and a material that is dispensed. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.	Any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state
Aerosol	Level 1	Those with a total chemical heat of combustion that is less than or equal to 8,600 Btu/lb (20kJ/g).	H223, Category 3; Pressurized container: May burst if heated: 1) Any aerosol that contains ≤ 1% flammable components (by mass) and that has a heat of combustion < 20 kJ/g; or 2) Any aerosol that contains > 1% (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2
Aerosol	Level 2	Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20kJ/g), but less than or equal to 13,000 Btu/lb (30kJ/g).	H223, Category 2; Flammable aerosol. Pressurized container: May burst if heated: 1) Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has: (a) a heat of combustion of >= 20 kJ/g; (b) a heat of combustion of < 20 kJ/g along with an ignition distance of >= 15 cm; or (c) a heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test a time: (i) - a time equivalent of ≤ 300 s/m3; or (ii) - a deflagration density of ≤ 300 g/m3; or 2) Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a flame height of ≥ 4 cm and a flame duration of ≥ 2 s.

Aerosol	Level 3	Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30kJ/g).	H222, Category 1; Extremely flammable aerosol. Pressurized container: May burst if heated: 1) Any aerosol that contains >= 85% flammable components (by mass) and has a heat of combustion of >= 30 kJ/g; 2) Any aerosol that dispenses a spray that, in the ignition distance test, has an ignition distance of >= 75 cm; or 3) Any aerosol that dispenses a foam that, in the foam flammability test, has: (a) a flame height of >= 20 cm and a flame duration of >= 2 s; or (b) a flame height of >= 4 cm and a flame duration of >= 7 s.
Combustible liquid	-	A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:	A flammable liquid means a liquid having a flash point of not more than 93°C
Combustible liquid	II	Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).	H226, Category 3; Flammable liquid and vapour: Flash point ≥ 23°C and ≤ 60°C
Combustible Liquid	IIIA	Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C)	H227, Category 4; Combustible liquid: Flash point > 60°C and ≤ 93°C
Combustible Liquid	IIIB	Liquids having closed cup flash points at or above 200°F (93°C).	N/A

Compressed Gas		A material or mixture of materials that: 1) Is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure, and 2) Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C). States of compressed gases: 1) Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C). 2) Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C). 3) Compressed gases in solution are nonliquefied gases that are dissolved in a solvent. 4) Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.	Gases under pressure are gases which are contained in a receptacle at a pressure of 200 kPa (gauge) or more at 20°C, or which are liquefied, or liquefied and refrigerated. H280, compressed gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ -50°C (-58°F). H280, liquefied gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). H280, dissolved gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is dissolved in a liquid phase solvent.
Corrosive		A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 CFR 173.137, such chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.	H314, Category 1 (1A, 1B, 1C); Causes severe skin burns and eye damage: Skin corrosion refers to the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.
Cryogenic fluid		A fluid having a boiling point lower than -130°F (-89.9°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101.3 kPa)	H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.

Cryogenic - Flammable	–	A cryogenic fluid that is flammable in its vapor state.	H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gasesH281, refrigerated liquefied gas would also apply
Cryogenic - Inert	–	A cryogenic fluid that is inert.	H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.
Cryogenic - Oxidizing	–	An oxidizing gas in the cryogenic state.	H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H281, refrigerated liquefied gas would also apply
Explosives	–	A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters. The term “Explosive” includes any material determined to be within the scope of USC Title 18: Ch. 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn CFR Parts 100-185.	An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.
Explosives	Unstable Explosives	–	H200; Unstable Explosive: Unstable explosives are those which are thermally unstable and/or too sensitive for normal handling, transport and use. Special precautions are necessary.
Explosives	Division 1.1	Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.	H201; Explosive; mass explosion hazard: Substances, mixtures and articles which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously).
Explosives	Division 1.2	Explosives that have a projection hazard but not a mass explosion hazard.	H202; Explosive; severe projection hazard: Substances, mixtures and articles which have a projection hazard but not a mass explosion hazard.

Explosives	Division 1.3	Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.	H203; Explosive; fire, blast or projection hazard: Substances, mixtures, and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard: (i) combustion of which gives rise to considerable radiant heat; or (ii) which burn one after another, producing minor blast or projection effects or both;
Explosives	Division 1.4	Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.	H204; Fire or projection hazard: Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.
Explosives	Division 1.4G	Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visual or audible effects by combustion or deflagration that complies with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR Parts 1500 and 1507.	N/A
Explosives	Division 1.5	Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.	H205; May mass explode in fire: Very insensitive substances or mixtures which have a mass explosion hazard: substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability or initiation or of transition from burning to detonation under normal conditions.
Explosives	Division 1.6	Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.	Extremely insensitive articles which do not have a mass explosion hazard: articles which predominantly contain extremely insensitive substances or mixtures and which demonstrate a negligible probability of accidental initiation or propagation.

Flammable Gas	Gaseous	A material which is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which: 1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13% or less by volume with air; or 2. Has a flammable range at 14.7 psia (101 kPa) with air of not less than 12%, regardless of the lower limit. The limits specified shall be determined at 14.7 psia (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gases H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s H280, compressed gas would also apply

Flammable Gas	Liquified	A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and Chemically unstable gases H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s AND A gas which when packaged under pressure, is partially liquid at temperatures above -50°C. A distinction is made between: (a) High pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C and (b) Low pressure liquefied gas: a gas with a critical temperature above +65°C. Refrigerated liquified gas A gas which when packaged is made partially liquid because of its low temperature. Dissolved gas A gas which when packaged under pressure is dissolved in a liquid phase solvent. H280, liquefied gas would also apply
Flammable Liquid		A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows	A liquid having a flash point of not more than 93°C. A flammable liquid is classified in one of the four categories for this class according to the following table:
Flammable Liquid	IA	Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).	H224, Category 1; Extremely flammable liquid and vapour: Flash point < 23°C and initial boiling point <= 35°C

Flammable Liquid	IB	Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).	H225, Category 2; Highly flammable liquid and vapour. Flash point < 23°C and initial boiling point > 35°C
Flammable Liquid	IC	Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).	H226, Category 3; Flammable liquid and vapour. Flash point >= 23°C and <= 60°C
Flammable Solid	–	A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retaining heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.0866 inch (2.2 mm) per second along its major axis.	A flammable solid is a solid which is readily combustible, or may cause or contribute to fire through friction. – A flammable solid is classified in one of the two categories for this class using method N.1 as described in Part III, sub-section 33.2.1 of the Manual of Tests and Criteria, according to: – H228, Category 1; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: (a) wetted zone does not stop fire; and (b) burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time <=5 min – H228, Category 2; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: (c) wetted zone stops the fire for at least 4 min; and (d) burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time > 5 min and <= 10 min

Highly Toxic		A material which produces a lethal dose or lethal concentration which falls within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of 200 mg or less per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/l or less of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g.	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. Oral H300, Category 1; Fatal if swallowed: LD50 ≤ 5 mg/kg bodyweight H300, Category 2; Fatal if swallowed: LD50 > 5 ≤ 50 mg/kg bodyweight Dermal H310, Category 1; Fatal in contact with skin: LD50 ≤ 50 mg/kg bodyweight H310, Category 2; Fatal in contact with skin: LD50 > 50 ≤ 200 mg/kg bodyweight Inhalation H330, Category 1; Fatal if inhaled: Gases: LC50 ≤ 100 ppm (4 hr) ≈ 200 ppm (1 hr) Vapours: LC50 ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) Dust/mist: LC50 ≤ 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr)
Inert Gas		A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces. Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen, and xenon.	Gases under pressure are gases which are contained in receptacles at a pressure of 200 kPa (gauge) or more at 20°C or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases, and refrigerated liquefied gases. *See Compressed gases/Gases under pressure.*

Organic Peroxide	–	An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can present an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.	Organic peroxides are liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures). Organic peroxides are thermally unstable substances or mixtures, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties: – (a) be liable to explosive decomposition; (b) burn rapidly; (c) be sensitive to impact or friction; (d) react dangerously with other substances.
Organic peroxide	UD	Organic peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition	H240, Organic Peroxide, Type A; Heating may cause an explosion: (a) Any organic peroxide which, as packaged, can detonate or deflagrate rapidly will be defined as organic peroxide TYPE A;
Organic Peroxide	I	Describes those formulations that are capable of deflagration but not detonation.	H241, Organic Peroxide, Type B; Heating may cause a fire or explosion: (b) Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as organic peroxide TYPE B;

Organic Peroxide	II	Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard	H242, Organic Peroxide, Type C; Heating may cause a fire: (c) Any organic peroxide possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as organic peroxide TYPE C; H242, Organic Peroxide, Type D; Heating may cause a fire: (d) Any organic peroxide which in laboratory testing: (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or (iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as organic peroxide TYPE D;
Organic Peroxide	III	Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.	H242, Organic Peroxide, Type E; Heating may cause a fire: (e) Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as organic peroxide TYPE E;
Organic Peroxide	IV	Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.	H242, Organic Peroxide, Type F; Heating may cause a fire: (f) Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as organic peroxide TYPE F;

Organic peroxide	V	Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.	H240, Organic Peroxide, Type G; Heating may cause a fire: (g) Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C or higher for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point of not less than 150 °C is used for desensitization, will be defined as organic peroxide TYPE G. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, it shall be defined as organic peroxide TYPE F.
Oxidizer		A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.	An oxidizing solid is a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. An oxidizing liquid is a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.
Oxidizer	4	An oxidizer that can undergo an explosive reaction due to contamination or exposure to a thermal or physical shock that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.	H271, Category 1; May cause fire or explosion; strong oxidizer: _ Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.

Oxidizer	3	An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.	H271, Category 1; May cause fire or explosion; strong oxidizer: Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.
Oxidizer	2	An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.	H272, Category 2; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Category 1 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose and the criteria for Category 1 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.

Oxidizer	1	An oxidizer that does not moderately increase the burning rate of combustible materials.	H272, Category 3; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Categories 1 and 2 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose and the criteria for Categories 1 and 2 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 65% aqueous nitric acid solution and cellulose; and the criteria for Categories 1 and 2 are not met.
Oxidizing gas	Gaseous	A gas that can support and accelerate combustion of other materials more than air does.	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, compressed gas would also apply
Oxidizing gas	Liquified	An oxidizing gas that is liquefied (liquefied gases are gases that, in a packaging under the charged pressure, are partially liquid at 68°F (20°C).	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, liquefied gas would also apply
Pyrophoric		A chemical with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	*Separate definitions based upon physical state, see below:*

Pyrophoric	Solid	A solid with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	H250, Category 1; Pyrophoric solid, Catches fire spontaneously if exposed to air: A pyrophoric solid is a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The solid ignites within 5 min of coming into contact with air.
Pyrophoric	Liquid	A liquid with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	H250, Category 1; Pyrophoric liquid, Catches fire spontaneously if exposed to air: A pyrophoric liquid is a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The liquid ignites within 5 min when added to an inert carrier and exposed to air, or it ignites or chars a filter paper on contact with air within 5 min. Testing is performed at 25 ±2℃ and 50 ±5% relative humidity.
Pyrophoric	Gas	A gas with an autoignition temperature in air, at or below a temperature of 130℉ (54 ℃).	H220, Category 1A; Extremely flammable gas. May ignite spontaneously if exposed to air: A pyrophoric gas is a flammable gas that is liable to ignite spontaneously in air at a temperature of 54°C or below. H280, compressed (or liquefied) gas would also apply.

Toxic		A chemical falling within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of more than 50 mg per kg, but not more than 500 mg per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of more than 200 mg per kg but not more than 1,000 mg per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of more than 200 ppm but not more than 2,000 ppm by volume or less of gas or vapor, or more than 2 mg/l but not more than 20 mg/l of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. Oral H301, Category 3; Toxic if swallowed: LD50 > 50 ≤ 300 mg/kg bodyweight H302, Category 4; Harmful if swallowed: LD50 > 300 ≤ 2,000 mg/kg bodyweight Dermal H311, Category 3, Toxic in contact with skin: LD50 > 200 ≤ 1,000 mg/kg bodyweight Inhalation H330, Category 2; Fatal if inhaled: Gases: LC50 > 100 ppm (4 hr) ≈ 200 ppm (1 hr) ≤ 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) Vapours: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) Dust/mist: LC50 > 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr) ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) H331, Category 3; Toxic if inhaled: Gases: LC50 > 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) ≤ 2,500 ppm (4 hr) ≈ 5,000 ppm (1 hr) Vapours: LC50 > 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) ≤ 10 mg/l (4 hr) ≈ 40 mg/l (1 hr) Dust/mist: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 1 mg/l (4 hr) ≈ 4 mg/l (1 hr)

Unstable (reactive)		A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:	Self-reactive substances or mixtures are thermally unstable liquids or solid substances or mixtures liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances and mixtures classified under the GHS as explosives, organic peroxides or as oxidizing. A self-reactive substance or mixture is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.
Unstable (reactive)	4	Materials that in themselves are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.	H240, Type A; Heating may cause an explosion: (a) Any self-reactive substance or mixture which can detonate or deflagrate rapidly, as packaged, will be defined as self-reactive substance TYPE A;
Unstable (reactive)	3	Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at the elevated temperatures and pressures.	H241, Type B; Heating may cause a fire or explosion: (b) Any self-reactive substance or mixture possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as self-reactive substance TYPE B;
Unstable (reactive)	2	Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.	H242, Type C; Heating may cause a fire: (c) Any self-reactive substance or mixture possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as self-reactive substance TYPE C; H242, Type D; Heating may cause a fire: (d) Any self-reactive substance or mixture which in laboratory testing: (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or (iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as self-reactive substance TYPE D;

Unstable (Reactive)	1	Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressures.	H242, Type E; Heating may cause a fire: (e) Any self-reactive substance or mixture which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as self-reactive substance TYPE E; H242, Type F; Heating may cause a fire: (f) Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as self-reactive substance TYPE F; (g) Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60 °C to 75 °C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as self-reactive substance TYPE G. If the mixture is not thermally stable or a diluent having a boiling point less than 150°C is used for desensitization, the mixture shall be defined as self-reactive substance TYPE F
Unstable (reactive) gas	Gaseous		A chemically unstable gas is a flammable gas that is able to react explosively even in the absence of air or oxygen. H220, Category 1A, Category A; Extremely flammable gas. May react explosively even in the absence of air: Flammable gases which are chemically unstable at 20°C and a standard pressure of 101.3 kPa. H220, Category 1A, Category B; Extremely flammable gas. May react explosively even in the absence of air at elevated pressure and/or temperature: Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a standard pressure greater than 101.3 kPa. H280, compressed gas would also apply.

Water reactive	3	Materials that react explosively with water without requiring heat or confinement.	H260, Category 1; In contact with water releases flammable gases which may ignite spontaneously: Any substance or mixture which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 liters per kilogram of substance over any one minute. (UN/DOT test methods: Test N.5, Part III, sub-section 33.4.1.4)
Water reactive	2	Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition of combustibles upon exposure to water or moisture.	H261, Category 2; In contact with water releases flammable gas: Any substance or mixture which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 liters per kilogram of substance per hour, and which does not meet the criteria for Category 1.
Water reactive	1	Materials that react with water with some release of energy, but not violently.	H261, Category 3; In contact with water releases flammable gas: Any substance or mixture which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 liters per kilogram of substance per hour, and which does not meet the criteria for Categories 1 and 2.

a. The table illustrates that there is not perfect alignment between the IFC and GHS definitions and provides information on similarities and difference between the two classification systems.

Revise as follows:

SECTION ~~E104~~ E105 REFERENCED STANDARDS

FCAC 6.1.6 Rooftop storage (7314)

IFC: 5003.13 (New), 5003.13.1 (New), 5003.13.2 (New), 5003.13.3 (New), 5003.13.4 (New), 5003.13.5 (New); IBC: [F] 307.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

5003.13 Outdoor Rooftop Storage, use and Handling. Storage, use and handling and use of hazardous materials on top of roofs or canopies shall be classified as rooftop storage or use and shall comply with Sections 5003.13.1 through 5003.13.5.

5003.13.1 Occupancy classification. Quantities of hazardous materials stored, used or handled on top of roofs or canopies shall be classified as rooftop storage or use and shall not be used to determine the occupancy classification of the building.

5003.13.2 Maximum allowable quantity per rooftop or canopy. The storage, use and handling of hazardous materials on top of a roof or canopies shall not exceed the maximum allowable quantity set forth in Tables 5003.1.1(1) and Table 5003.1.1(2). LP Gas storage and use shall be in accordance with Chapter 61.

Exceptions:

1. Pollution control, exhaust treatment and dust collection equipment.
2. Combustible liquids complying with Chapter 57 and NFPA 30.
3. Hydrogen storage at motor fuel dispensing facilities in accordance with Chapter 23.
4. Hazardous materials in closed piping systems complying with this code.
5. Hazardous materials on top of a normally unoccupied exterior equipment platform necessary for operation of mechanical systems or industrial process equipment.
6. Hazardous materials necessary for rooftop swimming pool or hot tub treatment systems, limited to maximum containers size of 50 gallons or 500 pounds of toxic or corrosive materials, and 200 pounds or 20 gallons of oxidizers.
7. Other situations where rooftop storage or use of hazardous materials is necessary for operation of equipment serving the building and is approved.

5003.13.3 Story adjustment. In addition to the quantity limits in 5003.13.2, rooftop storage and use shall be limited to the percentage of maximum allowable quantity identified in Table 5003.8.3.2 based on the number of stories above grade of the building on which the roof is located.

5003.13.4 Other requirements. In addition to the quantity limits of this section, rooftop storage and use shall comply with other applicable requirements of this code for outdoor storage. This section applies to the exceptions identified in 5003.13.2.

5003.13.4 New Code Section

Add new text as follows:

5003.13.5 Weather protection. Weather protection provided for sheltering rooftop storage or use it shall comply with Section 414.6.1 of the International Building Code, except that there is no distance required to the building on which it is located.

2021 International Building Code

Revise as follows:

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or *health hazard* in quantities in excess of those allowed in *control areas* complying with Section 414, based on the maximum allowable quantity limits for *control areas* set forth in Tables 307.1(1) and 307.1(2). Hazardous

occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*. *Hazardous materials* stored, or used on top of roofs or canopies, shall be classified as ~~outdoor~~ rooftop storage or use and shall comply with the *International Fire Code*.

Reason Statement: The proposed revisions provide clarity with respect to how to apply the existing provisions that restrict the installation of certain hazardous materials based on location within a jurisdiction. It also helps tie the fire code to other regulations adopted by the jurisdiction that might restrict permissible hazardous materials installations. Previously, Section 3 of the model adoption ordinance in the preamble of the code was tied to these sections and provided guidance on how to declare such restricted locations. However, the model adoption ordinance was deleted after the 2015 edition of the IFC and replaced in the 2018 edition with a preamble section on "Adoption," which is less specific. This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent of the proposal is simply to provide more clarity in code application.

FCAC 6.1.7 Hydrogen Fuel Cell Gas detection (6739)

IFC: CHAPTER 12, SECTION 1206, 1206.1, 1206.5, 1206.6, 1206.6.3, 1206.6.3.1, 1206.13

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 12
ENERGY SYSTEMS

SECTION 1206 STATIONARY FUEL CELL POWER SYSTEMS

Revise as follows:

1206.1 General.
Stationary fuel cell power systems in new and existing occupancies shall comply with this section.

Exception: The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1206.13 ~~1206.14~~.

1206.5 Residential use.
Stationary fuel cell power systems shall not be installed in Group R-3 and R-4 buildings, or *dwelling units* associated with Group R-2 buildings unless they are specifically *listed* for residential use.

Exception: The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section ~~1206.14~~ 1206.13.

1206.6 Indoor installations. *Stationary fuel cell power systems* installed in indoor locations shall comply with Sections 1206.6 through 1206.6.2. For purposes of this section, an indoor location includes a roof and 50 percent or greater enclosing walls.

Revise as follows:

~~**1206.13**~~ **1206.6.3 Gas detection systems.** *Stationary fuel cell power systems* shall be provided with a gas detection system. Detection shall be provided in *approved* locations in the fuel cell power system enclosure, the exhaust system or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

~~**1206.13.1**~~ **1206.6.3.1 System activation.** The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
3. Initiate local audible and visible alarms in *approved* locations.

~~**1206.14**~~ **1206.13 Group R-3 and R-4 fuel cell vehicle energy storage system use.** The temporary use of the *dwelling unit owner* or occupant's fuel cell-powered electric vehicle to power a Group R-3 or R-4 dwelling while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and NFPA 70.

Reason Statement: This proposal corrects an error made when the new fuel cell language was added to the 2018 edition of the IFC. The intent was to provide core requirements and guidance that is correlated to the existing standards which had been inexplicably left out of the IFC when added to the IMC and IFGC. With combination systems becoming more popular, (battery storage and fuel cell), it was important to add the language to the IFC to ensure comprehensive design and installation approaches matching what was done with NFPA 855 for ESS.
Unfortunately, an error occurred in the formatting of the new language when the detection requirement was taken from NFPA 853. That requirement applies to "Indoor installations" in NFPA 853 and the reason statement points to NFPA 853, but where added in the IFC it is being applied to indoor and outdoor installations which causes practical difficulties.

This proposal simply relocates the language to the "Indoor installation" requirements to correct the misapplication.

Original proposal adding the language:

F111-16

105.7.9 (New), 202 (New), 602.1, 612 (New), Chapter 80

Proponent : *Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)*

Reason: *Fuel cell power systems are being used in ever increasing numbers to meet facility energy needs. Stationary fuel cell pow er systems generate power through an electrochemical process that combines hydrogen and oxygen to produce electricity. The hydrogen comes from a direct hydrogen source or from any hydrocarbon fuel such as natural gas, gasoline, diesel, or methanol if the fuel cell pow er system includes integral reforming. The oxygen comes from air around the fuel cell. A new section is being proposed in the IFC which provides a comprehensive set of requirements to mitigate potential hazards associated with the installation and use of stationary fuel cell power systems.*

Three referenced documents form the basis for these requirements:

ANSI/CSA FC 1 standard is used to investigate and list the stationary fuel cells covered by this section. The construction and performance requirements in that standard address a variety of hazards, including mechanical, electrical, thermal, malfunction, erroneous human intervention and environmental.

NFPA 853, the Standard for the Installation of Stationary Fuel Cell Power Systems includes requirements for the design, construction, and installation of stationary fuel cell power systems.

NFPA 2, the Hydrogen Technologies Code covers the production, storage, transfer, and use of hydrogen in all occupancies and on all premises. Chapter 12 of this code includes requirements for the design, construction, and installation of stationary fuel cell power systems which are extracted from NFPA 853.

Comments on portions of the proposal are as follows:

612.3 *– Gas detection system requirements include detection locations from NFPA 853 and activation criteria that are consistent with IFC requirements.*

NFPA 853-2020 edition

(No change from 2015 edition)

Chapter 8 Fire Protection

8.1 Fire Protection and Detection.

8.1.5 Indoor Installation.

8.1.5.4* *Combustible gas detector(s) shall be installed in the fuel cell power system enclosure, the exhaust system, or the room that encloses the fuel cell power system installation in accordance with the detector manufacturer's instructions and local regulation.*

A.8.1.5.4 *A fuel cell power system that includes an internal combustible gas detector meets this requirement if it is supported by a separate safety analysis.*

8.1.5.5* *A combustible gas detector that meets the requirements of 8.1.5.4 shall be provided for all indoor or separately*

enclosed fuel gas compressors (fuel gas boosters).

A.8.1.5.5 *Fuel gas boosters (within the fuel cell enclosure containing fuel) containing members are addressed in ANSI/CSA FC 1, Fuel cell technologies — Part 3-100: Stationary fuel cell power systems — Safety, as part of the leak detection and mitigation strategy.*

8.1.5.6 *When gaseous or liquefied hydrogen is piped into the room or area from outside, hydrogen detector(s) shall be installed in accordance with 8.1.5.7.*

8.1.5.7 *The following criteria for combustible gas detection systems, including detection specific to hydrogen, shall be met:*

(1) The location of the detection device(s) shall be based on leakage sources and fuel type.

(2) The combustible gas detection system shall be arranged to alarm at 25 percent of the lower flammable limit (LFL) and be interlocked to shut down the power system fuel supply at 60 percent LFL.

(3) The LFL used shall be the lowest flammability limit of the gas or gas mixture.

Chapter 9 Fuel Cell Power Systems 50 kW or Less

9.1 Chapter Scope*. This chapter identifies additional requirements or modifications to Chapters 1 through 8 as they relate directly to fuel cell power systems 50 kW or less.*

9.5 Fire Protection*. The requirements of Chapter 8 shall not apply to 50 kW or smaller systems except as modified in 9.5.1 and 9.5.2.*

9.5.1 Combustible gas detection shall be installed in accordance with 8.1.5.4 through 8.1.5.6 except where the fuel gas system is listed for indoor use and the fuel is odorized natural gas or LP-Gas.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section was not intended to apply to outdoor installations so would not have been applicable. In cases where this was being enforced this may decrease the cost of construction.

FCAC 6.3.1 Mobile Fueling 1 (6831)

IFC: 5706.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5 Bulk transfer and process transfer operations. Bulk transfer and process transfer operations shall be *approved* and be in accordance with Sections 5706.5.1 through 5706.5.3.3 ~~5706.5.4.5~~. Motor fuel-dispensing facilities shall comply with Chapter 23.

FCAC 6.3.2 Mobile Fueling 2 (6834)

IFC: TABLE 906.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
1204.10	Portable generators
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3107.9	Tents and membrane structures
3206.10	High-piled storage
3316.1	Buildings under construction or demolition
3318.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5707.5.4	On-demand mobile fueling
5906.5.7	Flammable solids
6108.2	LP-gas

FCAC 6.3.3 Mobile Fueling 3 (6835)

IFC: 5706.5.4

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank cars into the fuel tanks of motor vehicles shall be prohibited. Dispensing from tank vehicles ~~and tank cars~~ into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5.

FCAC 6.3.4 Mobile Fueling 4 (6838)

IFC: 5707.1.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining ~~a *permit* and approval from the *fire code official*.~~ an operational permit in accordance with Section 105.6.16.

5707.1.2 Locations. Mobile fueling operations shall occur only at *approved* locations. The *fire code official* is authorized to approve individual locations or geographic areas where mobile fueling is allowed.

FCAC 6.3.5 Mobile Fueling 5 (6848)

IFC: 5707.2.1 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Add new text as follows:

5707.2.1 Trailers. On-demand mobile fueling shall not be conducted using tanks or containers mounted on or carried on a trailer.

FCAC 6.3.6 Mobile Fueling 6 (6850)

IFC: 5706.5.4.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

5706.5.4.5 Commercial, industrial, governmental or manufacturing.
Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where approved ~~permitted~~, provided that such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The *owner* of a mobile fueling operation shall provide to the jurisdiction a written response plan that demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained on the site property; and the scale of the site plan.

   Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other *approved* means.
4. The *fire code official* is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not open to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

   Exceptions:

   1. The distance to storm drains shall not apply where an *approved* storm drain cover or an *approved* equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
   2. The distance to storm drains shall not apply for drains that direct influent to *approved* oil interceptors.

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.

13. Tank vehicles shall be equipped with a “fuel limit” switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

    Exception: Tank vehicles where the operator carries and can utilize a remote emergency shutoff device that, when activated, immediately causes flow of fuel from the tank vehicle to cease.

14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

Reason Statement: This corrects a reference error. 5706.5.3.3 is the last section in the process transfer requirements. 5607.5.4 is the first section in the tank vehicle fueling requirements.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal merely corrects a cross reference.

FCAC 6.3.6 Mobile Fueling 6 (6850)

FCAC 6.4.1 On-demand Hydrogen Mobile Fueling Operations (6794)

IFC: CHAPTER 1, SECTION 105, 105.5, 105.5.26 (New), CHAPTER 2, SECTION 202, (New), CHAPTER 58, 5809 (New), 5809.1 (New), 5809.1.1 (New), 5809.2 (New), 5809.2.1 (New), 5809.3 (New), 5809.3.1 (New), 5809.3.2 (New), 5809.3.3 (New), 5809.4 (New), 5809.4.1 (New), 5809.4.2 (New), 5809.5 (New), 5809.5.1 (New), 5809.5.2 (New), 5809.6 (New), 5809.6.1 (New), 5809.6.2 (New), 5809.6.3 (New), 5809.6.4 (New), 5809.6.5 (New), 5809.6.6 (New), 5809.6.7 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Robert J Davidson, Davidson Code Concepts, LLC, representing Toyota, USA (rjd@davidsoncodeconcepts.com)

2021 International Fire Code

CHAPTER 1
SCOPE AND ADMINISTRATION

SECTION 105 PERMITS

105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.2 through 105.5.52.

Revise as follows:

105.5.26 Hydrogen mobile fueling An operational permit is required to utilize a location or geographic area for the dispensing of gaseous hydrogen from tank vehicles or tank trailers into the fuel tanks of hydrogen fueled motor vehicles for on-demand mobile fueling operations in accordance with Section 5809

CHAPTER 2
DEFINITIONS

SECTION 202 GENERAL DEFINITIONS

Revise as follows:

MOBILE FUELING, LIQUID. The operation of dispensing liquid fuels from tank vehicles into the fuel tanks of motor vehicles. Mobile fueling may also be known by the terms “Mobile fleet fueling,” “Wet fueling” and “Wet hosing.”

Add new text as follows:

MOBILE FUELING, HYDROGEN. The operation of dispensing gaseous hydrogen from tank vehicles or tank trailers into the fuel tanks of hydrogen fueled motor vehicles. Hydrogen mobile fueling may also be known by the terms “Hydrogen mobile fleet fueling.”

CHAPTER 58
FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS

Add new text as follows:

5809 On-Demand Hydrogen Mobile Fueling Operations

5809.1 General. On-demand hydrogen mobile fueling operations that dispenses gaseous hydrogen into the fuel tanks of motor vehicles shall comply with Sections 5809.1 through 5809.6.5.

5809.1.1 Approval required. Hydrogen mobile fueling operations shall not be conducted without first obtaining a permit and approval from the fire code official. Hydrogen mobile fueling operations shall occur only at approved locations. The fire code official is authorized to approve individual locations or geographic areas where mobile fueling is allowed.

5809.2 Hydrogen mobile fueling vehicle or trailer. An on-demand hydrogen mobile fueling vehicle or mobile fueling trailer shall be that which is utilized in on-demand fueling operations for the dispensing of gaseous hydrogen into the fuel tanks of motor vehicles.

5809.2.1 Hydrogen mobile fueling vehicle requirements. Each hydrogen mobile fueling vehicle or mobile fueling trailer shall comply with all local, state and federal requirements, as well as the following.

1. The hydrogen mobile fueling vehicle or mobile fueling trailer and its equipment shall be in compliance with the appropriate requirements of NFPA 2.
2. Hydrogen mobile fueling vehicles or mobile fueling trailers shall only contain and dispense gaseous hydrogen.
3. The hydrogen mobile fueling vehicle or mobile fueling trailer and its equipment shall be maintained in good repair.
4. Fueling a hydrogen motor vehicle shall be from tanks or containers mounted on a mobile fueling trailer or from tanks or containers mounted on a mobile fueling vehicle. A mobile fueling operation shall not combine a mobile fueling vehicle with a mobile fueling trailer.
5. Mobile fueling vehicles and trailers shall be provided with at least one portable fire extinguisher of a minimum 10-pound ABC dry chemical type and shall also be rated with an agent discharge rate of 1 lb/sec or greater.

5809.3 Required documents. Documents developed to comply with Sections 5809.3.1 through 5809.3.3 shall be updated as necessary by the owner of the mobile fueling operation and shall be maintained in compliance with Section 108.3.

5809.3.1 Safety and emergency response plan. Hydrogen mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, release and control, personnel training and compliance with other applicable requirements of this code.

5809.3.2 Training records. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

5809.3.3 Site plan. Where required by the fire code official, a site plan shall be developed for each location at which hydrogen mobile fueling occurs. The site plan shall be in sufficient detail to indicate the following:

1. All buildings and, structures
2. Lot lines or property lines
3. Solar photovoltaic parking lot canopies
4. Appurtenances on site and their use or function
5. All uses adjacent to the lot lines of the site
6. Hydrogen fueling locations
7. Scale of the site plan.

5809.4 Hydrogen mobile fueling areas. Hydrogen mobile fueling shall not occur on public streets, public ways or inside buildings. Fueling on the roof level of parking structures or other buildings is prohibited unless access to the roof level is available without entering the structure or building.

5809.4.1 Separation. The point of connection of the vehicle being fueled shall not take place within the distances specified by NFPA 2, Table 7.2.2.3.2 based upon the maximum rated capacity of the hydrogen mobile fueling vehicle.

5809.4.2 Sources of ignition. Smoking, open flames and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of fueling shall be prominently posted on the hydrogen mobile fueling vehicle. The fuel cell of vehicles being fueled shall be shut off during fueling.

5809.5 Equipment. Hydrogen mobile fueling equipment shall comply with Sections 5809.5.1 and 5809.5.2.

5809.5.1 Dispensing hoses, nozzles and equipment. Dispensing hoses, nozzles and equipment shall comply with NFPA 2.

5809.5.2 Fire extinguisher. An approved portable fire extinguisher complying with Section 906 with a minimum rating of 4-A:80-B:C shall be provided on the hydrogen mobile fueling vehicle with signage clearly indicating its location.

5809.6 Operations. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be operated in accordance with this section and NFPA 2.

5809.6.1 Attendant. Hydrogen mobile fueling vehicles or mobile fueling trailers shall be attended at all times during fueling operations with brakes set and warning lights in operation

5809.6.2 Emergency access roads. Hydrogen mobile fueling vehicles shall not obstruct emergency vehicle access roads.

5809.6.3 Dispensing hose. Where equipped, hydrogen mobile fueling vehicles or mobile fueling trailers shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be properly placed on an approved reel or in an approved compartment prior to moving the mobile fueling vehicle.

5809.6.4 Safety cones. Safety cones or other visual barriers shall be employed as warning devices to highlight the vehicle fueling area.

5809.6.5 Vehicle lights. The hydrogen mobile fueling vehicle or mobile fueling trailer flasher lights shall be in operation while dispensing operations are in progress.

5809.6.6 Nighttime deliveries. Nighttime deliveries shall only be made in areas deemed adequately lighted by the fire code official.

5809.6.7 Spill reporting. Releases shall be reported when required by Section 5003.3.1.

FCAC ESS Proposal 10 (7512)

IFC: 1207.5.4, 1207.5.4.1, Chapter 80 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

1207.5.4 Fire detection. An *approved* automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas and walk-in units containing electrochemical ESS. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where *approved* to a constantly attended location.

Exception: Normally unoccupied, remote stand-alone telecommunications structures with a gross floor area of less than 1500 ft^2 (139 m^2) utilizing lead-acid or nickel cadmium batteries shall not be required to have a fire detection system installed.

1207.5.4.1 System status.
Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in 1207.5.4.
~~Where required by the *fire code official*, visible annunciation shall be provided on cabinet exteriors or in other *approved* locations to indicate that potentially hazardous conditions associated with the ESS exist.~~

Add new text as follows:

Chapter 80 IEEE C2-2017 National Electrical Safety Code(R) (NESC(R))

Reason Statement: Starting in 2018 the IFC language was expanded to cover the emerging mobile fueling industry for liquid fuels to ensure safety of the operations and consistent application of the fire code provisions where these activities are occurring. Some local AHJ's had been reluctant to act upon this concept of fuel delivery due to lack of guidance in the fire code, other AHJ's are approving the concept based upon an alternative means of compliance. Some had been instructed to develop ordinances permitting the activity and in other areas, it had been outright prohibited, all of which was creating an inconsistent pattern.
The same pattern is now emerging for gaseous hydrogen on-demand mobile fueling. Similar to what was done for liquid fuel mobile fueling, these amendments are intended to provide fire code officials with the guidance needed to evaluate planned operations for mobile delivery of gaseous hydrogen. These amendments are designed to place requirements on service companies to demonstrate a sound and safe approach with the intent of obtaining an operational permit to begin delivery.

It should be noted that the safe use of mobile tube trailers for the fuel supply at fixed site hydrogen fueling activities and the use of mobile hydrogen fueling vehicles and trailers for events and demonstration projects has been occurring for years.

As of the end of 2020, almost 9000 fuel cell vehicles powered by hydrogen were in operation in the US. In addition, there are approximately 50 hydrogen fueling stations, primarily in California and the northeast US. Mobile fueling of gaseous hydrogen is an important option to support these vehicles by extending their driving range and in locations where stationary fueling infrastructure does not exist. Adding language for on-demand gaseous hydrogen mobile fueling is important to establish codes which local officials can use to properly permit mobile hydrogen fueling vehicles and trailers. The language proposed is based upon the on-demand mobile fueling for conventional fuels in Chapter 5707. The language was massaged to match the safety measures relative to gaseous hydrogen. It requires approval from the fire code official including an operational permit and sets requirements for the mobile fuelers and their equipment, areas where the fueling will take place and operations. A parallel effort is being coordinated in NFPA2, Hydrogen Technologies Code to ensure the requirements are harmonized.

Note that this is restricted to the use of gaseous hydrogen as opposed to liquid hydrogen which would be prohibited.

Similar to Section 5707 there are appropriate requirements for:

- Permits
- Definition for hydrogen mobile fueling
- Location approval
- Vehicle versus trailer use
- Requirements for the vehicle
- Required documentation
- Having an approved safety and emergency response plan
- Training records
- Site plan
- Restrictions on where the fueling can occur
- Separation from exposures as required by NFPA 2 (current IFC reference)
- Equipment requirements
- Operational requirements

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
As a mobile fueling service there is no impact on construction costs. There will be a cost benefit to users of hydrogen powered motor vehicles by increasing the utility and range of their clean energy vehicles.

FCAC WG1.4 – Proposal 1.4-2A - Occupiable Roof Definition

(6949)

IBC: SECTION 202 (New), SECTION 202, 503.1.4, 302.1, 503.1.4.1, 1004.7, 1006.1, 1006.3, 1006.3.1, 1006.3.2, 1006.3.4, 1006.3.3, 1009.2.1, 1011.12, 1011.12.2, 1011.15, 1011.16, 1019.3, 1011.14, 1104.4; IFC: 903.2.1.6, SECTION 202 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Revise as follows:

[BG] PENTHOUSE. An enclosed, unoccupiable ~~unoccupied~~ rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, *stairways,* and vertical *shaft* openings.

503.1.4 Occupiable ~~Occupied~~ roofs.
A roof level or portion thereof shall be permitted to be used as an occupiable ~~occupied~~ roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupiable ~~occupied~~ roofs shall not be included in the *building area* as regulated by Section 506. An occupiable ~~occupied~~ roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupiable ~~occupied~~ roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinker system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupiable ~~occupied~~ roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided in the area of the occupiable ~~occupied~~ roof where such system is required elsewhere in the building.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

302.1 Occupancy classification.
Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508 . Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupiable ~~Occupied~~ roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4 .

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

503.1.4.1 Enclosures over occupiable ~~occupied~~ roof areas.
Elements or structures enclosing the occupiable ~~occupied~~ roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupiable ~~occupied~~ roof.

Exception: *Penthouses* constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.

1004.7 Outdoor areas.
Yards, patios, occupiable ~~occupied~~ roofs, *courts* and similar outdoor areas accessible to and usable by the building occupants shall be provided with *means of egress* as required by this chapter. The *occupant load* of such outdoor areas shall be assigned by the *building official* in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the path of egress travel from the outdoor areas passes through the building, *means of egress* requirements for the building shall be based on the sum of the *occupant loads* of the building plus the outdoor areas.

Exceptions:

1. Outdoor areas used exclusively for service of the building need only have one *means of egress*.
2. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

1006.1 General. The number of *exits* or *exit access doorways* required within the *means of egress* system shall comply with the provisions of Section 1006.2 for spaces, including *mezzanines*, and Section 1006.3 for *stories* or occupiable ~~occupied~~ roofs.

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

1006.3.1 Occupant load. Where *stairways* serve more than one *story*, or more than one *story* and an occupiable ~~occupied~~ roof, only the *occupant load* of each *story* or occupiable ~~occupied~~ roof, considered individually, shall be used when calculating the required number of *exits* or access to *exits* serving that *story*.

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

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

1011.12 Stairway to roof.
In buildings four or more stories above grade plane, one *stairway* shall extend to the roof surface unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope).

Exception: Other than where required by Section 1011.12.1, in buildings without an occupiable ~~occupied~~ roof access to the roof from the top *story* shall be permitted to be by an *alternating tread device*, a ships ladder or a permanent ladder.

1011.12.2 Roof access.
Where a *stairway* is provided to a roof, access to the roof shall be provided through a *penthouse* complying with Section 1511.2.

Exception: In buildings without an occupiable ~~occupied~~ roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m^2) in area and having a minimum dimension of 2 feet (610 mm).

1011.15 Ship's ladders. Ship's ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupiable ~~unoccupied~~ roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ship's ladders shall be designed for the live loads indicated in Section 1607.17.

1011.16 Ladders.
Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code and designed for the live loads indicated in Section 1607.17. Permanent ladders shall be permitted to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.

5. Nonoccupiable ~~Nonoccupied~~ roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.

6. Where permitted to access equipment and appliances in accordance with Section 306.5 of the International Mechanical Code.

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

Exceptions:

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

1011.14 Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in buildings of Groups F, H and S from a *mezzanine* not more than 250 square feet (23 m^2) in area and that serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area and for access to unoccupiable ~~unoccupied~~ roofs. *Alternating tread devices* used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

1104.4 Multistory buildings and facilities.
At least one *accessible* route shall connect each accessible *story, mezzanine* and occupiable ~~occupied~~ roofs in multilevel buildings and *facilities*.

Exceptions:

1. An *accessible* route is not required to *stories, mezzanines* and occupiable ~~occupied~~ roofs that have an aggregate area of not more than 3,000 square feet (278.7 m^2) and are located above and below accessible levels. This exception shall not apply to:

   1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces used for the sales or rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels.

   1.2. *Stories* or *mezzanines* containing offices of health care providers (Group B or I).

   1.3. Passenger transportation facilities and airports (Group A-3 or B).

   1.4. Government buildings.

   1.5. Structures with four or more dwelling units.

2. *Stories*, *mezzanines* or occupiable ~~occupied~~ roofs that do not contain accessible elements or other spaces as determined by Section 1108 or 1109 are not required to be served by an accessible route from an *accessible* level.

3. In air traffic control towers, an *accessible route* is not required to serve the cab and the floor immediately below the cab.

4. Where a two-story building or facility has one *story* or *mezzanine* with an *occupant load* of five or fewer persons that does not contain *public use* space, that *story* or *mezzanine* shall not be required to be connected by an *accessible route* to the *story* above or below.

2021 International Fire Code

Revise as follows:

903.2.1.6 Assembly occupancies on roofs. Where an ~~occupied~~ occupiable roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the ~~occupied~~ occupiable roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Reason Statement: Over the last several cycles, code provisions have been added to address issues related to occupied/occupiable, vegetative and landscaped roofs. In some cases, the terms have been used interchangeably, in others applying to specific types of roof systems. With the increasing number of provisions, a definition is needed. A proposal last cycle (G7-19) attempted to add a definition for occupiable roof but was disapproved for several reasons including the fact it did not correlate with the fact the code uses “occupied roof” in some sections and “occupiable roof” in others.
This code proposal both adds a definition for “occupiable roof”and. changes terminology throughout the code to be consistent with use of “occupiable roof” rather than “occupied roof”. The definition is intended to parallel the existing code definition for occupiable space:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

The proposed definition is different in a few key ways: The laundry list of uses is left out, and the one clarification made that access for maintenance of rooftop mechanical equipment or other maintenance does not trigger assembly live load requirements or other provisions related to occupiable roofs. The references to light and ventilation are left out as occupiable roofs are exterior spaces. No mechanical ventilation is necessary, and the code does not require lighting for exterior spaces other than portions of the means of egress.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change is purely editorial and does not affect how occupiable roofs are designed or constructed.

FCAC WG1.4 – Proposal 1.4-2B - Landscaped to Vegetative Roof (7067)

IFC: SECTION 317, 317.1, 317.2, 317.4.3, 905.3.8, 504.3, SECTION 202 (New); IBC: [BF] 1505.10, [BF] 1507.15.1, SECTION 202, SECTION 202 (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

SECTION 317 VEGETATIVE ~~LANDSCAPED~~ ROOFS

317.1 General. Vegetative ~~Landscaped~~ roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.16 of the International Building Code and be installed and maintained in accordance with Sections 317,2 through 317.5.

317.2 Vegetative ~~Landscaped~~ roof size. Vegetative ~~Landscaped~~ roof areas shall not exceed 15,625 square feet

(1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a *listed* Class A roof assembly tested in accordance with ASTM E108 or UL 790 shall be provided between adjacent vegetative ~~landscaped~~ roof areas.

317.4.3 Maintenance plan. The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a vegetative ~~landscaped~~ roof, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.

905.3.8 Landscaped or vegetative roofs. Buildings or structures that have landscaped or vegetative roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the landscaped or vegetative roof is located.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where roofs are used for landscaped roofs, vegetative roofs or for other purposes, stairways shall be provided as required for such occupancy classification.

Add new definition as follows:

VEGETATIVE ROOF A roof assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

2021 International Building Code

Revise as follows:

[BF] 1505.10 Vegetative ~~Landscaped~~ roofs. Vegetative ~~Landscaped~~ roofs shall comply with Sections 1505.1 and 1507.15 and shall be installed in accordance with ANSI/SPRI VF-1.

[BF] 1507.15.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed on the roof by the *vegetative roof* or landscaped roofs shall comply with the fire resistance rating requirements of Table 601.

[BS] VEGETATIVE ROOF. A roof ~~An~~ assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

Add new definition as follows:

LANDSCAPED ROOF. An area on a roof incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of a roof assembly.

Reason Statement: This is an editorial proposal covering both the IFC and the IBC to consistently use the term "vegetative roof".
The term "landscaped roofs" has been used by the public interchangeably with "vegetative roofs". This has created confusion in the building code and conflicts with industry standards that have coalesced around the term "vegetative roof". . Moreover, some of the sections presently identified as "landscaped roofs" should refer to "vegetative roofs" as they really addresses roofs that are part of the building envelope and, thus, are associated with the existing definition of "vegetative roofs". In these locations, the code is revised to properly use "vegetative roof". In other places, both terms are retained as the language could apply either to a vegetative roof where the membrane, growth medium and vegetation are incorporated as part of the roof assembly, or a landscaped roof where planters, hardscapes, or other features are provided above the roof assembly and not integrated into it. A definition for "landscaped roofs" is proposed to capture such features and better distinguish between a true "vegetative roof" as defined in the IBC and industry standards.

Neither the IFC nor the IBC define the term "landscaped roof", but the IBC does contain a definition for the term "vegetative roofs" that reads as follows.

[BS] VEGETATIVE ROOF. *An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.*

This proposal also copies the existing definition from the IBC to the IFC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as BCAC website at BCAC .

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is editorial and will not impact how vegetative and landscaped roofs are designed and constructed.

FCAC WG1.4 – Proposal 1.4-5 - Raised Deck Systems (7092)

IBC: SECTION 202 (New), 1510.10 (New), 1510.10.1 (New), 1510.10.2 (New), 1510.10.3 (New), 1510.10.4 (New), 1510.10.5 (New), 1510.10.6 (New)

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Add new definition as follows:

RAISED-DECK SYSTEM. (For application to Chapter 15 only). A system consisting of decking or pavers supported by pedestals installed over a roof assembly to provide a walking surface.

Add new text as follows:

1510.10 *Raised-deck systems* installed over a *roof assembly*. *Raised-deck systems* installed above a *roof assembly* shall comply with Sections 1510.10.1 through 1510.10.5.

1510.10.1 Installation. The installation of a *raised-deck system* shall comply with all of the following:

1. The perimeter of the *raised-deck system* shall be surrounded on all sides by parapet walls or by a noncombustible enclosure approved to prevent fire intrusion below the *raised-deck system*. The parapet wall or enclosure shall extend above the plane of the top surface of the *raised deck system*.
2. A *raised-deck system* shall be installed above a listed roof assembly.

   Exception: Where the *roof assembly* is not required to have a fire classification in accordance with Section 1505.2.
3. A *raised-deck system* shall be installed in accordance with the manufacturer's installation instructions.
4. A *raised-deck system* shall not obstruct or block plumbing or mechanical vents, exhaust, or air inlets.

1510.10.2 Fire classification. The *raised-deck system* shall be tested, listed and labeled with a fire classification in accordance with Section 1505. The fire classification of the *raised deck system* shall be not less than the fire classification for the *roof covering* over which it is installed.

Exception: Where the top surface of the *raised deck system* consists of brick, masonry or concrete materials, a fire classification is not required.

1510.10.3 Pedestals or supports. The pedestals or supports for the *raised deck system* shall be installed in accordance with manufacturer's installation instructions.

1510.10.4 Structural requirements. The *raised-deck system* shall be designed for wind loads in accordance with Chapter 16 and Section 1504.4. The *raised-deck system* shall be designed for seismic loads in accordance with Chapter 16.

1510.10.5 Roof drainage. The *raised-deck system* shall not impede the operation of the roof drainage system as required by Section 1502 of this code and the *International Plumbing Code*.

1510.10.6 Access and Egress. Access to the *raised-deck system* shall be in accordance with Chapter 11 of this code and egress shall be in accordance with Chapter 10 of this code.

Reason Statement: Currently the IBC does not have any specific provisions for the design and installation of raised-deck systems. These provisions should be a subsection to Section 1510 because these systems are a roof structure over a roof assembly. A definition of "raised deck systems" is needed to ensure correct application of new requirements for these systems. This term is applicable only to Chapter 15 (same "Chapter 15 restriction" as the definition for roof assembly).
Fire test requirements for the raised deck systems are based on research studies performed for PV panels on low and steep-sloped roofs; which have general applicability to Raised Deck Systems. The following is a link to the reports for those studies: http://www.solarabcs.org/about/publications/reports/flammability-testing/index.html. These studies showed that when fire was able to enter the space between the roof assembly and the panel above, it could significantly alter the original test results for the fire classification of the roof assembly. By providing a protective barrier at the perimeter such as a parapet wall, roof curb or intersection with vegetative roof to prevent fire intrusion into the space, there would not be any concern with affects to the fire classification of the roof assembly underneath.

The manufacturer's installation instructions cover how the pedestals and supports are to be installed for these systems.

Three pointers (code references) for structural; roof water drainage; and access and egress are provided to ensure that these other safety and performance requirements essential for roofs are applied to Raised Deck Systems.

The pictures included with this code change illustrate examples of what a typical raised deck system consists of, including a photograph of an actual rooftop pool deck, two cross-sections of a typical raised deck system, and an isometric view of the typical components.

Cost Impact: The code change proposal will increase the cost of construction
The code change will increase the cost of construction, for those who decide to install these types of systems. However, this provides clarity on what requirements are to be applied for these installations.

Heat Pump Definition (6043)

IMC: SECTION 202; IRC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**HEAT PUMP.** A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.~~

HEAT PUMP.
A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] HEAT PUMP.** An *appliance* having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.~~

[MP] HEAT PUMP.
A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

High Hazard Classification of Flammable Gas (6057)

IBC: [F] 307.4, [F] 307.5

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

2021 International Building Code

Revise as follows:

[F] 307.4 High-hazard Group H-2.
Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.
Cryogenic fluids, flammable.
Category 1A *Flammable gases.*
Category 1B *Flammable gases* having a burning velocity greater than 3.9 in/s (10 cm/s).
Organic peroxides, Class I.
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).
*Pyrophoric*liquids, solids and gases, nondetonable.
Unstable (reactive) materials, Class 3, nondetonable.
Water-reactive materials, Class 3.

[F] 307.5 High-hazard Group H-3.
Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less
Combustible fibers, other than densely packed *baled cotton*, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or *explosion* hazard based on information prepared in accordance with Section 414.1.3
Consumer *fireworks*, 1.4G (Class C, Common)
Cryogenic fluids, oxidizing
Category 1B *flammable gases* having a burning velocity of 3.9 in/s (10 cm/s) or less
Flammable solids
Organic peroxides, Class II and III
Oxidizers, Class 2
Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
Oxidizing gases
Unstable (reactive) materials, Class 2
Water-reactive materials, Class 2

IFC 5.10.1 Section 605.11 Storage Use and Handling (6041)

IFC: 608.12

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

Revise as follows:

608.12 Storage, use and handling.
Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

Exception: These provisions shall not apply to:

1. ~~This provision shall not apply to~~ Spare parts, tools and incidental materials necessary for the safe and proper operation and maintenance of the system.

2. Refrigerant removed from equipment during a repair or replacement and temporarily stored in a pressure vessel complying with ASME BPVC Section VIII, for reuse after the repair or replacement has been completed.

LFL refrigerant (6068)

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

LOWER FLAMMABLE LIMIT (REFRIGERANT) (LFL). The minimum concentration of refrigerant ~~that is~~ at which a flame is capable of propagating ~~a flame~~ through a homogeneous mixture of refrigerant and air under specific test conditions in accordance with ASHRAE 34.

Outdoor Combustible Storage (7311)

IFC: CHAPTER 1, SECTION 105, [A] 105.1, 105.5.31, CHAPTER 2, SECTION 202, CHAPTER 3, SECTION 315, 315.1, 315.2, 315.3, 315.3.1, 315.3.2, 315.3.3, 315.3.4, 315.3.5 , 315.4 , 315.5, 315.5.1, 315.5.2, 315.5.3, 315.5.4, 315. 6, 315. 6.1 (New), 315.6.2 (New), 315.6.3 (New), 315.6.4 (New), 315. 6.5, 315. 6.6, 315. 6.6.1, 315. 6.6.2, 315.6.7 (New), TABLE 315. 6.6(1), TABLE 315. 6.6(2), TABLE 315. 6.6(3), TABLE 315. 6.6(4), 315.7.3, 315.7.1, 315.7.2

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Brambles, USA (rjd@davidsoncodeconcepts.com); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

CHAPTER 1
SCOPE AND ADMINISTRATION

SECTION 105 PERMITS

[A] 105.1 General. Permits shall be in accordance with Sections 105.1.1 through 105.6.24.

Revise as follows:

105.5.31 Miscellaneous combustible materials storage. An operational permit is required to store combustible materials in any room or compartment inside a building in excess of 2,500 cubic feet (71 m^3) gross volume, or in any single outside area on any premises in excess of ~~2,500~~ 5,000 cubic feet (~~71~~ 142 m^3) gross volume of ~~combustible empty packing cases, boxes, barrels or similar containers, combustible pallets, rubber tires, rubber, cork or similar~~ combustible material s.

CHAPTER 2
DEFINITIONS

Revise as follows:

SECTION 202 GENERAL DEFINITIONS
Add Definition:

Storage. The activity of keeping, holding or accumulating articles, materials or products for future use, disposal, or to be drawn upon as needed; may be temporary, transient or permanent in nature.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 315 GENERAL STORAGE

Revise as follows:

315.1 General.
Indoor ~~S~~ combustible materials storage shall be in accordance with Sections 315.2 through 315.~~6~~ 4. Outdoor ~~pallet~~ combustible materials storage shall be in accordance with Sections 315.2 and 315.4 through 315. 6.7.

Exception: ~~Wood and wood composite pallets stored outdoors at pallet manufacturing and recycling facilities and complying with Section 2810.~~

Outdoor combustible storage facilities complying with Chapter 28

315.2 Permit required. A permit for miscellaneous combustible materials storage shall be required as set forth in Section 105.5.

315.3 Storage in buildings. Storage of materials in buildings shall be orderly and stacks shall be stable. Storage of combustible materials shall be separated from heaters or heating devices by distance or shielding so that ignition cannot occur.

315.3.1 Ceiling clearance.
Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less

than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

315.3.2 Means of egress. Combustible materials shall not be stored in *exits* or enclosures for *stairways* and *ramps*. Combustible materials in the *means of egress* during construction, demolition, remodeling or *alterations* shall comply with Section 3312.3.

315.3.3 Equipment rooms. Combustible material shall not be stored in boiler rooms, mechanical rooms, electrical equipment rooms or in *fire command centers* as specified in Section 508.1.5.

315.3.4 Attic, under-floor and concealed spaces. Attic, under-floor and concealed spaces used for storage of combustible materials shall be protected on the storage side as required for 1-hour *fire-resistance-rated* construction. Openings shall be protected by assemblies that are self-closing and are of noncombustible construction or solid wood core not less than $1^3/_4$ inches (44.5 mm) in thickness. Storage shall not be placed on exposed joists.

Exceptions:

1. Areas protected by *approved automatic sprinkler systems*.
2. Group R-3 and Group U occupancies.

Revise as follows:

315.3.5 ~~6~~ Storage in plenums. Storage is prohibited in plenums. Abandoned material in plenums shall be deemed to be storage and shall be removed. Where located in plenums, the portion of abandoned cables that are able to be accessed without causing damage, or requiring demolition to the building shall be identified for future use with a tag or shall be deemed storage and shall be removed.

315.4 ~~7.5~~ Pallet types. For the purpose of indoor or outside storage requirements ~~P~~ pallets shall be all wood, with slatted or solid top or bottom, with metal fasteners, or shall be plastic or composite pallets, *listed* and *labeled* in accordance with UL 2335 or FM 4996 and be treated as Class I, II and III commodities in Tables 315.6.6(1) 315.6.6(3). Plastic pallets shall be both solid and gridded deck, independent of the pallet manufacturing process, type of resin used in fabrication or geometry of the pallet and be treated as IV and High-hazard commodities in Tables 315.6.6(2) and 315.6.6(4).

315.5 General outdoor storage ~~Storage underneath high-voltage transmission lines.~~ ~~Storage located underneath high-voltage transmission lines shall be in accordance with Section 316.6.2.~~
Outside storage of combustible materials shall comply with this section. Outdoor storage of combustible materials in excess of 5,000 cubic feet (142 m^3) shall also comply with Sections 315.6 through 315.6.7.

315.5.1 ~~4~~ Distance to lot line ~~Outside storage~~. Outside storage of combustible materials shall not be located within 10 feet (3048 mm) of a *lot line*.

Exceptions:

1. The separation distance is allowed to be reduced to 3 feet (914 mm) for storage not exceeding 6 feet (1829 mm) in height.
2. The separation distance is allowed to be reduced where the *fire code official* determines that hazard to the adjoining property does not exist.

315.5.2 ~~4.1~~ Storage beneath overhead projections from buildings. Where buildings are protected by an *automatic sprinkler system*, the outdoor storage, display and handling of combustible materials under eaves, canopies or other projections or overhangs are prohibited except where automatic sprinklers are installed under such eaves, canopies or other projections or overhangs.

315.5.3 ~~4.2~~ Height. Storage in the open shall not exceed 20 feet (6096 mm) in height.

315.5.4 ~~7.7~~ Prohibited locations. ~~Pallets~~ Combustible materials shall not be stored underneath high-voltage

transmission lines, elevated roadways or elevated railways.

Exception: Materials under high-voltage transmission lines in accordance with Section 316.6.2

315.~~7~~ 6 Outdoor ~~pallet~~ storage in excess of 5,000 cubic feet (142 m^3). ~~Pallets~~ Combustible materials in excess of 5,000 cubic feet (142 m3) stored outdoors shall comply with Sections 315.~~7~~ 6 through 315.~~7.7~~ 6.6.2 in addition to the applicable general requirements above. ~~Pallets stored within a building shall be protected in accordance with Chapter 32.~~ Combustible materials shall be classified as Class I, II, III, IV or high-hazard commodities in accordance with Chapter 32

315. 6.1 Site plan Each site shall maintain a current site plan. The site plan shall be submitted to the fire code official for approval, and contain all of the following:

1. Lot Lines

2. Utilities.

3. Size, location and type of construction of the buildings on the site.

4. Presence of the fire protection systems.

5. Water supply sources for fire-fighting purposes.

6. Location of hazardous material storage areas.

7. Location of combustible storage.

8. Equipment protected with a dust collection system.

9. Fire apparatus access roads.

10. Designated smoking areas.

11. Location of fire alarm control panels.

315.6.2 Fire prevention plan The owner or owner's authorized representative shall submit a fire prevention plan for review and approval by the fire code official that includes all of the following:

1. Frequency of walk-through inspections to verify compliance with the plan.

2. Hot work permit program in accordance with Chapter 35.

3. Preventive maintenance program for equipment associated with pallet activities.

4. Inspection, testing and maintenance of fire protection systems in accordance with Chapter 9

315.6.3 Fire safety and evacuation plan The owner or owner's authorized representative shall prepare and train employees in an approved fire safety and evacuation plan in accordance with Chapter 4.

315.6.4 Security management plan The owner or owner's authorized representative shall prepare a security management plan based on a security risk assessment and shall make the plan and assessment available to the fire code official upon request.

315.~~7.4~~ 6.5 ~~Pallet p~~ Pile stability and size. ~~Pallet~~ Combustible material stacks shall be arranged to form stable piles. Individual ~~pallet~~ combustible material piles shall cover an area not greater than 400 square feet (37 m^2).

315.~~7~~ 6.6 Pile separation distances. In addition to the other requirements of this section, ~~pallet~~ combustible material stacks and piles shall be separated in accordance with Sections 315.~~7~~ 6.6.1 and 315.~~7~~ 6.6.2.

315.~~7~~ 6.6.1 Building separation. ~~Pallet~~ Combustible material stacks and piles shall be separated from buildings in accordance with Table 315.~~7~~ 6.6(1) for ~~wood pallets~~ Class I, II and III commodities and Table 315.~~7~~ 6.6(2) for ~~plastic pallets~~ Class IV and high-hazard commodities.

315.~~7~~ 6.6.2 Separation from other ~~pallets~~ combustible materials and on-site storage. ~~Pallets~~ Combustible materials shall be separated from other ~~pallet~~ combustible material piles and other storage in accordance with Table 315.~~7~~ 6.6(3) for ~~wood pallets~~ Class I, II, and III commodities and Table 315.~~7~~ 6.6(4) for ~~plastic pallets~~ Class IV and high-

hazard commodities.

315.6.7 Modification of storage limitations. The fire code official is authorized to permit increased pile sizes and reduced clearances when the site is provided with mitigation measures and fire protection systems suitable for the hazards presented by the stored combustible material. Requests for pile size increases or clearance reductions shall be submitted for review and approval and identify the specific mitigation measures and fire protection system capabilities that address potential fires and their control

TABLE 315.~~7~~ 6.6(1)
SEPARATION DISTANCE BETWEEN ~~WOOD PALLET~~ CLASS I, II, AND III COMMODITIES STACKS AND BUILDINGS

WALL CONSTRUCTION	OPENING TYPE	~~WOOD PALLET~~ CLASS I, II, III COMMODITIES SEPARATION DISTANCE (feet)		
		~~≤ 50 Pallets~~ ≤224 cubic feet	~~51 to 200 Pallets~~ >224 cubic feet to 894 cubic feet	~~> 200 Pallets~~ >894 cubic feet
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	2	5	20
Masonry	Fire-rated glazing	5	10	20
Masonry	Plain glass with open sprinklers	5	10	20
Noncombustible	None	5	10	20
Wood with open sprinklers	—	5	10	20
Wood	None	15	30	90
Any	Plain glass	15	30	90

For SI: 1 foot = 304.8 mm.

TABLE 315.~~7~~ 6.6(2)
SEPARATION DISTANCE BETWEEN ~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES STACKS AND BUILDINGS

WALL CONSTRUCTION	OPENING TYPE	~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES SEPARATION DISTANCE (feet)		
		~~≤ 50 Pallets~~ ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	10	20	50
Masonry	Fire-rated glazing	15	40	100
Masonry	Plain glass with open sprinklers	15	40	100
Noncombustible	None	15	40	100
Wood with open sprinklers	—	15	40	100
Wood	None	30	80	150
Any	Plain glass	30	80	150

For SI: 1 foot = 304.8 mm.

TABLE 315.~~7~~ 6.6(3)
SEPARATION OF CLASS I, II, AND III COMMODITIES FROM OTHER ~~PALLET~~ PILES AND ON-SITE STORAGE ~~(WOOD PALLETS)~~

	~~WOOD PALLET~~ CLASS I, II, AND III COMMODITIES SEPARATION DISTANCE (feet)		
	≤ 50 Pallets ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Between pallet piles	7.5	15	45
Other on-site storage	7.5	15	45

For SI: 1 foot = 304.8 mm.

TABLE 315.~~7~~ 6.6(4)
SEPARATION OF CLASS IV AND HIGH-HAZARD COMMODITIES FROM OTHER ~~PALLET~~ PILES AND ON-SITE STORAGE ~~(PLASTIC PALLETS)~~

	~~PLASTIC PALLET~~ CLASS IV AND HIGH-HAZARD COMMODITIES SEPARATION DISTANCE (feet)		
	~~≤ 50 Pallets~~ ≤224 CUBIC FEET	~~51 to 200 Pallets~~ >224 CUBIC FEET TO 894 CUBIC FEET	~~> 200 Pallets~~ >894 CUBIC FEET
Between pallet piles	15	40	75
Other on-site storage	15	40	75

For SI: 1 foot = 304.8 mm.

Delete without substitution:

~~**315.7.3 Storage height.** Pallet storage shall not exceed 20 feet (6096 mm) in height.~~

~~**315.7.1 Storage beneath overhead projections from buildings.** Where buildings are equipped throughout with an *automatic sprinkler system*, the outdoor storage of pallets under eaves, canopies or other projections or overhangs are prohibited except where automatic sprinklers are installed under such eaves, canopies or other projections or overhangs.~~

~~**315.7.2 Distance to lot line.** Pallet storage shall not be located within 10 feet (3048 mm) of a *lot line*.~~

Refrigerant Definition (6044)

IMC: SECTION 202; IRC: SECTION 202; IFC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**REFRIGERANT.** A substance utilized to produce refrigeration by its expansion or vaporization.~~

REFRIGERANT. The fluid used for heat transfer in a refrigeration system that undergoes a change of state to absorb heat.

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] REFRIGERANT.** A substance used to produce refrigeration by its expansion or evaporation.~~

[MP] REFRIGERANT. The fluid used for heat transfer in a refrigeration system that refrigerant undergoes a change of state to absorb heat.

2021 International Fire Code

Revise as follows:

REFRIGERANT. The fluid used for heat transfer in a refrigeration system~~; the refrigerant~~ that undergoes a change of state to absorb heat.

Refrigerant Safety Group Classification (6107)

IMC: SECTION 202

Proponents: Joseph J. Summers, Chair of the PMGCAC, representing Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

REFRIGERANT SAFETY GROUP CLASSIFICATION. The ~~alphabetical/numerical~~ alphanumeric designation that indicates both the toxicity and flammability classifications of refrigerants in accordance with ASHRAE 34.

Delete without substitution:

~~**TOXICITY CLASSIFICATION (REFRIGERANT).** An alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with low toxicity. Class B indicates a refrigerant with high toxicity.~~

~~**FLAMMABILITY CLASSIFICATION (REFRIGERANT).** The alphabetical/numerical designation used to identify the flammability of refrigerants.~~

Reason Statement: There are two different definitions in the I-codes for “heat pump”. The IRC definition identifies heat pumps as an appliance, and the IMC identifies heat pumps as are refrigeration system. This definition is clarifying that a heat pump could be either an appliance or a refrigeration system. This definition is also simplified that a heat pump is transferring heat into a space or substance. The reference to “beneficial purpose” in the IMC is commentary. The proposed new common definition is closely aligned with the term used in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.
For information purposes, the following are the other definitions:

From the IRC: [MP] HEAT PUMP. An appliance having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.

From the IMC: HEAT PUMP. A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.

From ASHRAE 15: HEAT PUMP a refrigerating system used to transfer heat into a space or substance.
From UL 60335-2-40: HEAT PUMP appliance which takes up heat at a certain temperature and releases heat at a higher temperature

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.