

IBC — General



**2018 GROUP A PROPOSED
CHANGES TO THE I-CODES
COLUMBUS COMMITTEE ACTION
HEARINGS**

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2018 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

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TENTATIVE ORDER OF DISCUSSION 2018 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

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

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

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G1-18

IBC: SECTION 202, 202

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (stthomas@coloradocode.net)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BG] ATRIUM. An opening connecting two or more stories other than ~~enclosed stairways~~interior exit stairways or ramps, exit access stairways or ramps, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

Reason:

The terms "interior exit stairways or ramps" and "exit access stairway or ramps" referenced in Chapter 10 were added in the 2012 and 2015 IBC. However, they were not referenced in the Atrium definition. This change is only intended to clean up the language and provide consistency within the code. It may be considered to be editorial.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The change is editorial in nature. Therefore, there is no cost implication.

Internal ID: 210

G2-18

IBC: SECTION 202, 202

Proponent: Gregory Keith, representing The Boeing Company (grkeith@mac.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BG] ATRIUM. An opening connecting two or more stories ~~other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air conditioning or other equipment, which is closed at the top and not defined as a mall. Stories other than those vertical openings listed at Sections 712.1.1 through 712.1.6 and Sections 712.1.8 through 712.1.14.~~ Stories, as used in this definition, do not include balconies within assembly ~~groups~~ occupancies or mezzanines that comply with Section 505.

Reason:

The current definition of ATRIUM can be confusing. It describes in simple terms what an atrium is. In an apparent attempt to provide clarification it also provides a partial list of what an atrium is not. Included in the list were enclosed stairways. Enclosed stairways could include both interior exit stairways and enclosed exit access stairways. Appropriate reference to unenclosed exit access stairways is not made. In any event, the other vertical openings list is incomplete. The present incomplete "laundry list" has been replaced with specific reference to all other applicable vertical openings listed at Section 712.1.

Fundamentally, vertical openings serve one of three purposes: utility, means of egress or architectural. This distinction is made within the proposed definition.

Additionally, an editorial correction was made to the ultimate sentence by changing assembly groups to assembly occupancies.

Approval of this proposal will provide clarification as to what constitutes an atrium for the benefit of code users.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is essentially editorial in nature.

Internal ID: 1547

G3-18

IBC: SECTION 202, 202 (New)

Proponent: Amanda Hickman, representing RIMA International (amanda@thehickmangroup.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

EMITTANCE The ratio of radiant heat flux emitted by a specimen to that emitted by a blackbody at the same temperature and under the same conditions.

Reason:

This definition is needed because the term emittance is used in various sections of the code and in the definition for radiant barrier. It is consistent with the definition found in ASHRAE and ASTM standards.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Adding a definition of EMITTANCE will neither increase or decrease construction costs. This is only a definition and is identical to the definition found in existing ASHRAE and ASTM standards.

Internal ID: 1090

G4-18

IBC: 202

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BE] GRADE FLOOR EMERGENCY ESCAPE AND RESCUE OPENING. ~~A window or other~~ An emergency escape and rescue opening located such that the ~~sill height~~ bottom of the clear opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

Reason:

This is one of a series of 11 proposals to coordinate the Emergency Escape and Rescue Openings (EERO) technical criteria in the IBC and IRC. Please see the proposal for the definition of Emergency Escape and Rescue Openings for additional information. Due to the code development schedule the proposals for IBC will be proposed in Group A and the proposals for IRC will be proposed in Group B.

The phrase “grade floor emergency escape and rescue opening” is used in IBC 1030.2 and IRC R310.2.1. The definition should be for the phrase as utilized in the text. The definition for EEROs includes “windows, doors or other similar devices.” Using the defined term EERO instead of “windows and other openings” encompasses all options.

What is a ‘sill’ is not clear – the change to “bottom of the clear opening” will set a specific height for consistency with technical criteria.

There will be a Group B proposal for the IRC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/codedevelopment-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This coordination of an existing definition with no technical changes to the text.

Internal ID: 455

G5-18 Part I

PART 1:IBC: 202; IFC: 202;

PART 2: IPMC: 202 (New)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. PART 2 WILL BE HEARD BY THE PROPERTY MAINTENANCE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

2018 International Fire Code

SECTION 202 GENERAL DEFINITIONS

Revise as follows:

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

Internal ID: 454

G5-18 Part II

IPMC: SECTION 202, 202 (New)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Property Maintenance Code

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows:

EMERGENCY ESCAPE AND RESCUE OPENING. An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

Reason:

The intent of this proposal is to coordinate the definitions for emergency escape and rescue openings (EERO) between IBC, IRC, IEBC, IPMC, IFC. The EERO is always an exterior opening, and this descriptor is in the definition in IRC. The definition should appear in all codes where there are criteria for EEROs, so the definition should be added to IPMC and IEBC.

There will be a code proposal in Group B to coordinate IRC and IEBC.

This is the start of a series of 11 proposals to coordinate the requirements for Emergency Escape and Rescue Opening (EERO) requirements, primarily in the IBC and IRC, but also in the IEBC, IPMC and IFC. Due to the code development schedule the proposals for IBC, IPMC and IFC will be proposed in Group A and the proposals for IRC and IEBC will be proposed in Group B.

So that it is clear what the result of these overall proposals will be, the following is a clean version of what the text for EERO would be if all proposals are approved. The one section in the IRC that the BCAC is not proposing to duplicate in the IBC is the allowance for a EERO to be located below a deck.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/codedevelopment-process/building-code-action-committee-bcac>.

This is what the EERO requirements would look like if all of the proposals are approved.

IBC

EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

GRADE FLOOR EMERGENCY ESCAPE AND RESCUE OPENING. An emergency escape and rescue opening located such that the bottom of the clear opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

SECTION 1030

EMERGENCY ESCAPE AND RESCUE

1030.1 Where required. In addition to the means of egress required by this chapter emergency escape and rescue openings shall be provided in the following occupancies:

1. Group R-2 occupancies located in stories with only one exit or access to only one exit as permitted by Tables 1006.3.3(1) and 1006.3.3(2)
2. Group R-3 and R-4 occupancies.

Basements and sleeping rooms below the fourth story above grade plane shall have no fewer than one emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, an emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:

1. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape

and rescue openings.

2. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, court or exterior egress balcony that opens to a public way.

3. Basements used only to house mechanical equipment and having not more than 200 square feet (18.6 m²) in floor area shall not be required to have emergency escape and rescue openings.

4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.

5. Within individual dwelling and sleeping units in Groups R-2 and R-3, where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:

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

5.2. Two means of egress.

1030.1.1 Operational constraints and opening control devices. Emergency escape and rescue openings shall be operational from inside the room without the use of keys or tools. Window opening control devices on windows serving as a required emergency escape and rescue opening shall comply with ASTM F2090.

1030.2 Emergency escape and rescue openings. Emergency escape and rescue opening shall have minimum dimensions in accordance with Section 1030.2.1 through 1030.2.3.

1030.2.1 Minimum size. Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.53 m²).

Exception: The minimum net clear opening for grade-floor emergency escape and rescue openings shall be 5 square feet (0.46 m²).

1030.2.2 Minimum dimensions. The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm). The net clear opening dimensions shall be the result of normal operation of the opening.

1030.2.3 Maximum height from floor. Where a window is provided as the Emergency escape and rescue openings, such window shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor.

1030.3 Emergency escape and rescue doors. Where a door is provided as the required emergency escape and rescue opening, it shall be a swinging door or a sliding door.

1030.4 Area wells. An emergency escape and rescue opening with the bottom of the clear opening below the adjacent grade shall be provided with an area well in accordance with Sections 1030.4.1 through 1030.4.4.

1030.4.1 Minimum size. The minimum horizontal area of the area well shall be 9 square feet (0.84 m²), with a horizontal projection and width of not less than 36 inches (914 mm). The area well shall allow the emergency escape and rescue opening to be fully opened.

Exception: The ladder or steps required by Section 1030.4.2.1 shall be permitted to encroach not more than 6 inches (152 mm) into the required dimensions of the area well.

1030.4.2 Ladders or steps. Area wells with a vertical depth of more than 44 inches (1118 mm) shall be equipped with an approved permanently affixed ladder or steps. The ladder or steps shall not be obstructed by the emergency escape and rescue opening when the window or door is in the open position. Ladders or steps required by this section shall not be required to comply with Section 1011.

1030.4.2.1 Ladders. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the area well.

1030.4.2.2 Steps. Steps shall have an inside width of at least 12 inches (305 mm), shall have minimum treads depth of 5 inches (127 mm) and a maximum riser height of 18 inches (457 mm) for the full height of the area well.

1030.4.3 Drainage. Area wells shall be designed for proper drainage by connecting to the building's foundation drainage system required by Section 1805.

Exception: A drainage system for area wells is not required where the foundation is on well-drained soil or sand-gravel mixture soils in accordance with the United Soil Classification System, Group I Soils, in accordance with Section 1803.5.1.

1030.4.4 Bars, grilles, covers and screens. Where Bars, grilles, covers, screens or similar devices are placed

over emergency escape and rescue openings, bulkhead enclosures, or area wells that serve such openings the minimum net clear opening size shall comply with Section 1030.1.1 through 1030.2.2 and 1030.4. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

IRC

[RB] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or similar device that provides for a means of escape and access for rescue in the event of an emergency.

GRADE FLOOR EMERGENCY ESCAPE AND RESCUE OPENING. An emergency escape and rescue opening located such that the bottom of the clear opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

SECTION R310

EMERGENCY ESCAPE AND RESCUE OPENINGS

R310.1 Where required. Basements, habitable attics and every sleeping room shall have no fewer than one emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way, or to a yard or court that opens to a public way.

Exceptions:

1. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue openings.
2. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, or that opens to a public way.
3. Basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m²) shall not be required to have emergency escape and rescue openings.
4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. Where the dwelling or townhouse is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:
 - 5.1. One means of egress complying with Section R311 and one emergency escape and rescue opening.
 - 5.2. Two means of egress complying with Section R311.

R310.1.1 Operational constraints and opening control devices. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, or tools. Window opening control devices on windows serving as a required emergency escape and rescue opening shall comply with ASTM F2090.

R310.2 Emergency escape and rescue openings. Emergency escape and rescue openings shall have minimum dimensions in accordance with Section R310.2.1 through R310.2.3.

R310.2.1 Minimum size. Emergency and escape rescue openings shall have a net clear opening of not less than 5.7 square feet (0.530 m²).

Exception: The minimum net clear opening for grade-floor emergency escape and rescue openings shall be 5 square feet (0.465 m²).

R310.2.2 Minimum dimensions. The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm). The net clear opening dimensions shall be the result of normal operation of the opening.

R310.2.3 Maximum height from floor. Where a window is provided as the emergency escape and rescue openings such window shall have the bottom of the clear opening not greater than 44 inches (1118 mm) above the floor.

R310.3 Emergency escape and rescue doors. Where a door is provided as the required emergency escape and rescue opening, it shall be a swinging door or a sliding door.

R310.4 Area wells. An emergency escape and rescue opening with the bottom of the clear opening below the adjacent grade shall be provided with an area well in accordance with Sections R310.4.1 through R310.4.4.

R310.4.1 Minimum size. The horizontal area of the area well shall be not less than 9 square feet (0.9 m²), with a horizontal projection and width of not less than 36 inches (914 mm). The area well shall allow the emergency escape and rescue opening to be fully opened.

Exception: The ladder or steps required by Section R310.4.2.1 shall be permitted to encroach not more than 6 inches (152 mm) into the required dimensions of the area well.

R310.4.2 Ladder and steps. Area wells with a vertical depth greater than 44 inches (1118 mm) shall be equipped with a an approved permanently affixed ladder or steps. The ladder or steps shall not be obstructed by the emergency escape and rescue opening when the window or door is in the open position. Ladders or steps required by this section shall not be required to comply with Section R311.7.

R310.4.2.1 Ladders. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the area well.

R310.4.2.2 Steps. Steps shall have an inside width of at least 12 inches (305 mm), shall have minimum treads depth of 5 inches (127 mm) and a maximum riser height of 18 inches (457 mm) for the full height of the area well.

R310.4.3 Drainage. Area wells shall be designed for proper drainage by connecting to the building's foundation drainage system required by Section R405.1.

Exception: A drainage system for area wells is not required where the foundation is on well-drained soil or sand-gravel mixture soils in accordance with the United Soil Classification System, Group I Soils, as detailed in Table R405.1.

R310.4.4 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over emergency escape and rescue openings, bulkhead enclosures, or area wells that serve such openings, the minimum net clear opening size shall comply with Sections R310.2 through R310.2.2 and R310.4.1. Such devices shall be releasable or removable from the inside without the use of a key or tool or force greater than that required for the normal operation of the escape and rescue opening.

R310.5 Emergency escape and rescue openings under decks and porches. Emergency escape and rescue openings installed under decks and porches shall be fully operable and provide a path not less than 36 inches (914 mm) in height to a yard or court.

IFC

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

403.10.3.6 Resident participation in drills. Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.

Exception: Actual exiting from emergency escape and rescue openings shall not be required. Opening the emergency escape and rescue openings and signaling for help shall be an acceptable alternative.

1031.7 Emergency escape and rescue openings. Required emergency escape and rescue openings shall be maintained in accordance with the code in effect at the time of construction, and both of the following:

1. Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.
2. Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and the unit is equipped with smoke alarms installed in accordance with Section 907.2.11 of the International Building Code. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

IEBC

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

IEBC (prescriptive method)

505.4 Emergency escape and rescue openings. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.

Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and the unit is equipped with smoke alarms installed in accordance with Section 907.2.11 of the International Building Code. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

IEBC (Alterations Level 1)

701.4 Emergency escape and rescue openings. Emergency escape and rescue openings shall be operational

from the inside of the room without the use of keys or tools.

Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and the unit is equipped with smoke alarms installed in accordance with Section 907.2.11 of the International Building Code. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

IPMC

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

[F] 702.4 Emergency escape and rescue openings. Required emergency escape and rescue openings shall be maintained in accordance with the code in effect at the time of construction, and both of the following:

1. Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.

2. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and the unit is equipped with smoke alarms installed in accordance with Section 907.2.11 of the International Building Code. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the escape and rescue opening.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This coordination of an existing definition with no technical changes to the text.

Internal ID: 3406

G6-18

IBC: SECTION 202, 202 (New)

Proponent: John Woestman, Kellen Co., representing Extruded Polystyrene Foam Association (XPSA)
(jwoestman@kellencompany.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

INSULATING SHEATHING A rigid panel or board insulation material having a thermal resistance of not less than R-2 of the core material with properties suitable for use on walls, floors, roofs, or foundations.

Reason:

This proposed definition is based on the similar definition in the IRC. The proposal improves the definition to better fit context of use of this term and material in the IBC and IRC. For example, the term "rigid panel" is added to recognize composite assemblies that are not homogenous. The clarification of use in walls, floors, roofs, and foundations reflects common use of foam plastic insulating sheathing materials. The current IRC definition is as follows:

INSULATING SHEATHING: An insulating board having a thermal resistance of not less than R-2 of the core material.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed definition is for a term already used in the IBC and will have no cost impact.

Internal ID: 978

G7-18

IBC: SECTION 202, 202

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BF] INTERIOR WALL AND CEILING FINISH. The exposed interior surfaces of buildings, including but not limited to: fixed or movable walls and partitions; ~~toilet room privacy partitions~~; columns; ceilings; and interior wainscoting, paneling or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including trim.

Reason:

Toilet partitions and urinal partitions are regulated by Section 1209. It was incorrect to add “toilet room privacy partitions” to the interior wall and ceiling finish. The important aspect of water closet and urinal partitions is the sanitation of the wall surfaces, as well as, the cleanability. Another important aspect is privacy when using plumbing fixtures. While the privacy for using a water closet seems obvious, studies have shown the plumbing industry the need to provide privacy even when using a urinal in the men’s room. Other considerations for water closet and urinal partitions are resistance to scratching and graffiti. Manufacturers have developed high quality partitions to meet the needs of commercial buildings.

The interior finish requirements are concerned with the fire aspects of a building component. However, there is no history of a fire concern with water closet and urinal partitions. A study was completed by NFPA Research entitled, “Non-Residential Structure Fires That Originated in Lavatories, Locker Rooms or Coat Check Rooms,” dated November 2017, authored by Marty Ahrens. The report shows no issue with water closet or urinal partitions. There are no fire deaths reported from fires originating in a commercial toilet room. Hence, the perceived fire hazard does not exist with partitions in commercial toilet rooms and bathrooms. It is more important to emphasize the sanitary and health issues as identified in Section 1209.

Bibliography:

Ahrens, M. (2017). Non-Residential Structure Fires that Originated in Lavatories, Locker Rooms or Coat Check Rooms. Quincy, MA: NFPA Research.

<https://www.dropbox.com/sh/0e177098908o5up/AADoei27Mnp3XfjaA9rreawQa?dl=0>: Established 1.24.18

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Internal ID: 1844

G8-18

IBC: SECTION 202, 202 (New)

Proponent: James Smith, American Wood Council, representing ICC Region III Code Development Committee (jsmith@awc.org); Edward Lisinski, City of West Allis, WI, representing Self (elisinski@westalliswi.gov)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

MOTOR VEHICLE. A vehicle on wheels or other conveyance system, having its own motor to propel the vehicle, and not running on rails or tracks, for use on land, streets, or highways; such as an automobile, truck, bus, forklift, and which is manually operated.

Reason:

The reason for this proposal is to eliminate the confusion about what types of vehicles are applied to the code sections that regulate "MOTOR VEHICLES". There are numerous code sections that apply to MOTOR VEHICLES, but even though there is a definition for "COMMERCIAL MOTOR VEHICLE", there is no clear definition as to what a MOTOR VEHICLE is even though the term is embedded in that other definition. The same is true for the definitions of "Private Garage" and "Repair Garage". There are 15 locations in the IBC and 5 sections in the IMC that include the term. If you go with a rudimentary explanation, it is a vehicle with a motor. That could include cars, trucks, motorcycles, boats, trains, lawnmowers, children's toys, electric golf carts, electric scooters, airplanes and many more vehicles. We feel it is clear that the code does not intend children's toys to be regulated by those sections and airplanes are regulated within the sections of the code referring to aircraft, or Aircraft-Related Occupancies (Section 412) and not intended to be also regulated by the Motor-Vehicle-Related Occupancies Section (Section 406) of the code. A clear definition ensures that all provisions of the code that have requirements for MOTOR VEHICLES are applied uniformly.

In reviewing the code provisions that regulated MOTOR VEHICLES we felt they could be grouped into three basic areas:

1. Impact protection from operator error
2. Fumes related to fuel vapor accumulation related to internal combustion powered motor vehicles that are not being operated
3. Fumes related to combustion of the internal combustion engines when the motor is being operated.

We believe the proposed definition should include all vehicles with motors that are intended to be regulated by the various code sections. For that reason the proposed definition excludes any vehicle used in the air, water or on rails. The definition would only include vehicles such as cars, motorcycles, trucks, buses, recreational vehicles, forklifts and similar vehicles that are stored, repaired or operated inside a building. Although a definition could be written to exclude vehicles that are powered by electric motors and which do not produce fumes associated with fuel of the combustion process, we did not feel there were enough of those to create two definitions in this proposal.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The addition of the definition is only being provided to assist users of the code when confronted by those code sections that regulate MOTOR VEHICLES. There are no added regulatory provisions.

Internal ID: 731

G9-18

IBC: SECTION 202, 202

Proponent: Mike Fischer, Kellen Company, representing The Plastic Glazing Coalition of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[B G] WALKWAY, PEDESTRIAN. A structure that provides a walkway used exclusively as ~~a~~ for pedestrian trafficway traffic.

Reason:

The IBC includes technical requirements for pedestrian walkways that are clearly intended for specific structures such as skybridges, elevated walkways, and similar structures. Unfortunately, the definition for pedestrian walkways is overly broad and would apply to sidewalks, paths, and similar lot features. By indicating that the walkway is an actual structure, the definition is more appropriately scoped.

Try this Google image search and see all of the different types of structures- including footpaths and sidewalks- that appear:

https://www.google.com/search?q=Pedestrian+Walkway&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiohvisn9DYAhWK7IMKHRQ-BkEQ_AUICigB&biw=1536&bih=769

One such example of a code provision that is intended to apply to elevated bridges that connect two separate buildings is found in Section 3104.5.1:

3104.5.1 Fire barriers. Pedestrian walkways shall be separated from the interior of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 and Sections 3104.5.1.1 through 3104.5.1.3.

The proposal cleans up the definition to ensure that provisions (such as the 2-hour rating above) for structures like skywalks or bridges aren't extended where they aren't intended to apply.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The change is editorial in nature and makes no real technical changes to the code.

Internal ID: 2060

G10-18

IBC: 202

Proponent: Marcelo Hirschler, GBH International, representing GBH International (gbhint@aol.com); Mike Fischer, Kellen Company, representing The Plastic Glazing Coalition of the American Chemistry Council

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Delete without substitution:

~~**[BF] PLASTIC, APPROVED.** Any thermoplastic, thermosetting or reinforced thermosetting plastic material that conforms to combustibility classifications specified in the section applicable to the application and plastic type.~~

Reason: Hirschler

This term (plastic, approved) is not used in ICC codes.

The term "approved plastic" is also not used in isolation but always in conjunction with a specific requirement.

In the 2015 IBC code there were 3 instances of generic references to "approved plastic" and they were removed by proposals S311 and S312. Proposal S311 revised section H106.1.1 to state "approved plastic complying with the requirements of Section 2606.4", which are the requirements for light transmitting plastics. Proposal S312 deleted the references to "approved plastic" and replaced them with references to plastics complying with section H107.1.1.

The codes do not have "approved plastics" just like they do not have "approved wood" or "approved steel" but the codes have (as they should) plastics that are approved for use only when they comply with certain requirements.

Fischer

The proposal removes an unnecessary and potentially confusing definition of "approved plastics". This definition is used only once in the code; there are many more instances where it could be applied- IF that is necessary. The IBC has a definition of approved and contains clear provisions for the materials covered by Section H106.1.1 with the reference to fire testing in Section 2606.4. It is unnecessary to have a definition that is redundant to the code requirements. Italicizing the word "approved" makes it clear the IBC definition of approved applies.

Note that it is the intent of this proposal that the word "approved" be italicized in the first sentence of Section H106.1.1. cdpACCESS would not allow this change. Section H106.1.1 is as follows.

H106.1.1 Internally illuminated signs. Except as provided for in Section 2611, where internally illuminated signs have facings of wood or of approved plastic complying with the requirements of Section 2606.4, the area of such facing section shall be not more than 120 square feet (11.16 m²) and the wiring for electric lighting shall be entirely enclosed in the sign cabinet with a clearance of not less than 2 inches (51 mm) from the facing material. The dimensional limitation of 120 square feet (11.16 m²) shall not apply to sign facing sections made from flame-resistant-coated fabric (ordinarily known as "flexible sign face plastic") that weighs less than 20 ounces per square yard (678 g/m²) and that, when tested in accordance with NFPA 701, meets the fire propagation performance requirements of both Test 1 and Test 2 or that, when tested in accordance with an approved test method, exhibits an average burn time of 2 seconds or less and a burning extent of 5.9 inches (150 mm) or less for 10 specimens.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This simply deletes an unused and misleading definition.

The proposal is editorial and changes no technical requirements.

Internal ID: 168

G11-18

IBC: SECTION 202, 202

Proponent: Mike Fischer, Kellen Company, representing The Plastic Glazing Coalition of the American Chemistry Council (mfischer@kellencompany.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BF] PLASTIC GLAZING. Plastic materials that are glazed or set in a frame or sash or are otherwise supported.

Reason:

The current code indicates that plastic glazing by definition is set in a frame or sash; there are other means of supporting plastic glazing including through fastening. The revised definition acknowledges other supporting options.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is editorial and does not alter current requirements.

Internal ID: 2035

G12-18

IBC: SECTION 202, 202

Proponent: Craig Conner, self, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingscience.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BF] VAPOR PERMEABLE. The property of having a moisture vapor permeance rating of 5 perms (2.9×10^{-10} kg/Pa \times s \times m²) or greater, when tested in accordance with ~~the desiccant method using~~ Procedure A or Procedure B of ASTM E96. A vapor permeable material permits the passage of moisture vapor.

Reason:

Relying on only Procedure A is inaccurate and misleading. The existing code language limits the use of newer materials and systems such as “smart” materials that can be “tuned” to address moisture control issues in different climate zones. The existing definition applied to asphalt felts and Type D coated papers and dates back over a half a century. For Type D papers the original Federal Specification UUP-147 was issued in 1948. The technical rationale for this change can be found in the following link:

<https://buildingscience.com/documents/building-science-insights/bsi-099-its-all-relative> (as accessed on January 10, 2018)

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This adds a test procedure that is more appropriate for some products.

Internal ID: 1316

G13-18

IBC: SECTION 303.1.5 (New), 304.2 (New), 304.3 (New), 304.4 (New), 305.3 (New), 306.2.1 (New), 308.2, 308.3.1, 308.4, 309.3 (New), 310.1, 311.1.2 (New), 311.2.1 (New), 311.2.2 (New), 311.3, 311.3.1 (New), 312.2 (New), 312.3 (New)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

SECTION 303 ASSEMBLY GROUP A

303.1 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Add new text as follows:

303.1.5 Special amusement buildings. Special amusement buildings shall comply with Section 411.

SECTION 304 BUSINESS GROUP B

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- *Ambulatory care facilities*
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- *Clinic, outpatient*
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade, including higher education laboratories.
- Electronic data processing
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m²) in area.
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

Add new text as follows:

304.2 Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2.

304.3 Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422.

304.4 Higher education laboratories. Higher education laboratories shall comply with Section 428.

SECTION 305 EDUCATIONAL GROUP E

305.3 Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4.

SECTION 306 FACTORY GROUP F

Revise as follows:

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent 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
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m²) in area.
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods

- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Wood; distillation
- Woodworking (cabinet)

Add new text as follows:

306.2.1 Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6.

SECTION 308 INSTITUTIONAL GROUP I

Revise as follows:

308.2 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section 308.2.1 or 308.2.2 ~~and shall comply with Section 420.~~ This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities
- *Group homes*
- Halfway houses
- Residential board and care facilities
- Social rehabilitation facilities

308.3 Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

- *Foster care facilities*
- *Detoxification facilities*
- *Hospitals*
- *Nursing homes*
- *Psychiatric hospitals*

308.3.1 Occupancy conditions. Buildings of Group I-2 shall be classified as one of the occupancy conditions specified in Section 308.3.1.1 or 308.3.1.2 ~~and shall comply with Section 407.~~

308.4 Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally *incapable of self-preservation* due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

- Correctional centers
- Detention centers
- Jails
- Prerelease centers
- Prisons
- Reformatories

Buildings of Group I-3 shall be classified as one of the occupancy conditions specified in Sections 308.4.1 through 308.4.5 (~~see Section 408.1~~) and shall comply with Section 408.

SECTION 309 MERCANTILE GROUP M

Add new text as follows:

309.1 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Markets
- Greenhouses for display and sale of plants that provide public access.
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

309.3 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7.

SECTION 310 RESIDENTIAL GROUP R

Revise as follows:

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code. Group R occupancies not constructed in accordance with the International Residential Code as permitted by Sections 301.4.1 and 301.4.2 shall comply with Section 420.

SECTION 311 STORAGE GROUP S

Add new text as follows:

311.1.2 Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413.

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
- Books and paper in rolls or packs
- Boots and shoes

- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- Self-service storage facility (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

311.2.1 Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3.

311.2.2 Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8.

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 alcohol in metal, glass or ceramic containers
- 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
- ~~Parking~~ Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

311.3.1 Public parking garages. Public parking garages shall comply with Section 406.4 and the additional requirements of Section 406.5 for open parking garages or Section 406.6 for enclosed parking garages.

SECTION 312 UTILITY AND MISCELLANEOUS GROUP U

312.2 Private garages and carports. Private garages and carports shall comply with Section 406.3.

312.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4.

Reason:

During the 2015-2015 code development cycle, a series of proposals were submitted to relocate the bulk of the detailed use and occupancy requirements in Chapter 4 to other sections of the code, primarily Chapter 3. The primary justification was concern that some code users may overlook key Chapter 4 criteria that apply to their buildings. The proposals were all defeated, most of them overwhelmingly.

The concern still remains, especially as Chapter 4 remains a dumping ground for use- or occupancy-related provisions that don't have a clear home elsewhere in the code. The BCAC elected to revisit the issue, but rather than taking a chainsaw to the provisions and clearing out huge clumps opted for a more surgical approach. Primarily, the BCAC proposes to add a series of pointers from the appropriate occupancy groups in Chapter 3 to the relevant provisions in Chapter 4. Pointers to uses in Chapter 4 which can occur in a variety of different occupancy groups are added in Section 302. These changes will highlight for architects, engineers and building officials when detailed provisions in Chapter 4 apply to a building, or portion thereof, which they are designing or reviewing.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code change proposal will not increase or decrease the cost of construction. This is an editorial reorganization to place requirements in a more appropriate location.

G14-18

IBC: 303.1, 303.1.3

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

SECTION 303 ASSEMBLY GROUP A

Revise as follows:

303.1 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

303.1.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy, with an occupant load of 300 or less, is not considered a separate occupancy.

Reason:

To be consistent, the exceptions for assembly spaces in Section 303.1.1 through 303.1.4 (below) seem to indicate that the exceptions are intended for small spaces. However, the language in 303.1.3 has been widely interpreted. Some people feel this should be limited to spaces just typically open to students - such as libraries, music rooms, band rooms, and cafeterias. Others have interpreted this to include large gymnasiums and auditoriums with significant seating. While a school basketball game may be a school function, there would be students from another school, as well as significant number of the public, including a high percentage of families. The same concern for large number of the public also hold true in an auditorium.

303.1.1 Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an occupantload of less than 50 persons shall be classified as a Group B occupancy.

303.1.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
2. A room or space used for assembly purposes that is less than 750 square feet (70 m2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

303.1.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

303.1.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

This also may be considered a conflict with Section 302.1 which states "A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied."

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will increase the cost of construction .

This code change proposal will increase the cost of construction. Sprinkler system installation in new construction for a Group A can vary from \$1.00 to \$3.00 per square foot. This proposal will require larger gymnasiums and auditoriums associated with a Group E occupancy to be protected with a fire suppression system in areas where the previous interpretation was to allow these larger spaces to be considered part of the Group E occupancy.

Internal ID: 183

G15-18 Part I

PART I - IBC: 303.4, 309.1

PART II - IBC: TABLE 1004.5, (IFC[BE] TABLE 1004.5)

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

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

2018 International Building Code

Revise as follows:

303.4 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

- Amusement arcades
- Art galleries more than 3,000 square feet
- Bowling alleys
- Community halls
- Courtrooms
- Dance halls (not including food or drink consumption)
- Exhibition halls
- Funeral parlors
- Greenhouses for the conservation and exhibition of plants that provide public access.
- Gymnasiums (without spectator seating)
- Indoor *swimming pools* (without spectator seating)
- Indoor tennis courts (without spectator seating)
- Lecture halls
- Libraries
- Museums
- *Places of religious worship*
- Pool and billiard parlors
- Waiting areas in transportation terminals

309.1 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Art galleries 3,000 square feet or less
- Department stores
- Drug stores
- Markets
- Greenhouses for display and sale of plants that provide public access.
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

G15-18 Part II

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

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

**TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT**

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR^a
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	20 gross
Baggage claim	300 gross
Baggage handling	100 gross
Concourse Waiting areas	15 gross
Assembly	11 gross
Gaming floors (keno, slots, etc.)	30 net
Exhibit gallery and museum	
Assembly with fixed seats	See Section 1004.6
Assembly without fixed seats	7 net
Concentrated	5 net
(chairs only—not fixed)	15 net
Standing space	
Unconcentrated (tables and chairs)	
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	150 gross
Concentrated business use areas	See Section 1004.8
Courtrooms—other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	20 net
Classroom area	50 net
Shops and other vocational room areas	
Exercise rooms	50 gross
Group H-5 fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	240 gross
Inpatient treatment areas	100 gross
Outpatient areas	120 gross
Sleeping areas	
Kitchens, commercial	200 gross
Library	50 net
Reading rooms	100 gross
Stack area	
Locker rooms	50 gross
Mall buildings—covered and open	See Section 402.8.2
Mercantile	60 gross
<u>Art gallery</u>	<u>30 gross</u>
Storage stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	50 gross
Rink and pool	15 gross
Decks	
Stages and platforms	15 net
Warehouses	500 gross

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- a. Floor area in square feet per occupant.

Reason:

Provides limited sized art gallery space occupancy classification and the corresponding occupant load factor alignment in the code with the common business practices of selling artistic wares and goods.

This change will allow small commercial storefronts for retail sales of unique and limited-edition items to patrons browsing displayed works, interacting with sales people and making purchases, to be classified as Mercantile Occupancies. This change is similar in concept to the current small space allowances for an Assembly Occupancy to have a classification as a Business Occupancy.

This change maintains the required standards for hazards associated with the current occupancy classification of A-3 for Art Gallery spaces greater than 3,000 square feet and large Mercantile occupancies.

Cost Impact

The code change proposal will decrease the cost of construction .

This code revision has an anticipated cost benefit to the AHJ and building owners/tenants by a reduction in overall expenditures throughout the entire process of permitting, construction, inspection, and operation of retail type businesses in small spaces where an occupancy classification change is currently required. This revision may also provide a cost benefit to the AHJ by increasing business opportunities for individuals and organizations by reducing or eliminating the cost barriers of substantial alterations in these smaller spaces that are often associated with a change in occupancy classification.

Internal ID: 3402

G16-18

IBC: 202, (New), 202, 306.2, 311.2, 406.2.4, 406.2.5, 406.5.4.1, 406.7.2, 406.8.2, 510.3, TABLE 1607.1

Proponent: James Smith, American Wood Council, representing ICC Region III Code Development Committee (jsmith@awc.org); Edward Lisinski, City of West Allis, WI, representing ICC Region III Code Development Committee (elisinski@westalliswi.gov)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

LIQUID FUEL OR COMPRESSED GAS POWERED MOTOR VEHICLE A vehicle on wheels or other conveyance system, having its own liquid fuel or compressed gas powered motor to propel the vehicle, and not running on rails or tracks, for use on land, streets or highways, such as an automobile, truck, bus, forklift or similar motor vehicle, and which is manually operated.

Revise as follows:

[BG] OPEN PARKING GARAGE. A structure or portion of a structure with the openings as described in Section 406.5.2 on two or more sides that is used for the parking or storage of private liquid fuel or compressed gas powered motor vehicles as described in Section 406.5.3.

[BG] PRIVATE GARAGE. A building or portion of a building in which liquid fuel or compressed gas powered motor vehicles used by the owner or tenants of the building or buildings on the premises are stored or kept, without provisions for repairing or servicing such vehicles for profit.

[BG] REPAIR GARAGE. A building, structure or portion thereof used for servicing or repairing liquid fuel or compressed gas powered motor vehicles.

SECTION 306 FACTORY GROUP F

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 liquid fuel or compressed gas powered motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants

- Electronics
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m²) in area.
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- 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
- 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~~ Liquid fuel or compressed gas powered motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed 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

406.2.4 Floor surfaces. Floor surfaces shall be of concrete or similar approved noncombustible and nonabsorbent materials. The area of floor used for the parking of ~~automobiles or other~~ liquid fuel or compressed gas powered motor vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. The surface of vehicle fueling pads in motor fuel-dispensing facilities shall be in accordance with Section 406.7.1.

Exceptions:

1. Asphalt parking surfaces shall be permitted at ground level for public parking garages and private carports.
2. Floors of Group S-2 parking garages shall not be required to have a sloped surface.
3. Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm², as determined by ASTM E648 or NFPA 253, shall be permitted in repair garages.

406.2.5 Sleeping rooms. Openings between a liquid fuel or compressed gas powered motor vehicle-related occupancy and a room used for sleeping purposes shall not be permitted.

406.5.4.1 Single use. Where the *open parking garage* is used exclusively for the parking or storage of private liquid fuel or compressed gas powered motor vehicles, and the building is without other uses, the area and height shall be permitted to comply with Table 406.5.4, along with increases allowed by Section 406.5.5.

Exception: The grade-level tier is permitted to contain an office, waiting and toilet rooms having a total combined area of not more than 1,000 square feet (93 m²). Such area need not be separated from the *open parking garage*.

In *open parking garages* having a spiral or sloping floor, the horizontal projection of the structure at any cross section shall not exceed the allowable area per parking tier. In the case of an *open parking garage* having a continuous spiral floor, each 9 feet 6 inches (2896 mm) of height, or portion thereof, shall be considered under these provisions to be a tier.

406.7.2 Canopies. Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches (4115 mm) to the lowest projecting element in the vehicle drive-through area. Canopies and their supports over pumps shall be of noncombustible materials, *fire-retardant-treated wood* complying with Chapter 23, heavy timber complying with Section 2304.11 or construction providing 1-hour *fire resistance*. Combustible materials used in or on a *canopy* shall comply with one of the following:

1. Shielded from the pumps by a noncombustible element of the *canopy*, or heavy timber complying

with Section 2304.11.

2. Plastics covered by aluminum facing having a thickness of not less than 0.010 inch (0.30 mm) or corrosion-resistant steel having a base metal thickness of not less than 0.016 inch (0.41 mm). The plastic shall have a *flame spread index* of 25 or less and a smoke-developed index of 450 or less when tested in the form intended for use in accordance with ASTM E84 or UL 723 and a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.
3. Panels constructed of light-transmitting plastic materials shall be permitted to be installed in *canopies* erected over liquid fuel or compressed gas powered motor vehicle fuel-dispensing station fuel dispensers, provided that the panels are located not less than 10 feet (3048 mm) from any building on the same *lot* and face *yards* or streets not less than 40 feet (12 192 mm) in width on the other sides. The aggregate areas of plastics shall be not greater than 1,000 square feet (93 m²). The maximum area of any individual panel shall be not greater than 100 square feet (9.3 m²).

[F] 406.8.2 Gas detection system. Repair garages used for repair of liquid fuel or compressed gas powered motor vehicles fueled by nonodorized gases including but not limited to hydrogen and nonodorized LNG, shall be provided with a gas detection system that complies with Section 916. The gas detection system shall be designed to detect leakage of nonodorized gaseous fuel. Where lubrication or chassis service pits are provided in garages used for repairing nonodorized LNG-fueled vehicles, gas sensors shall be provided in such pits.

510.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage with not more than one *story above grade plane* and located below a Group S-2 open *parking garage* shall be classified as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the *fire-resistance* requirements of the Group S-2 *open parking garage*.
3. The height and the number of tiers of the Group S-2 *open parking garage* shall be limited as specified in Table 406.5.4.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 *open parking garage* shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 *open parking garage*, except *exit* openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private liquid fuel or compressed gas powered motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m²) and mechanical equipment rooms incidental to the operation of the building.

TABLE 1607.1

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_0 , AND MINIMUM CONCENTRATED LIVE LOADS⁹

Portions of table not shown remain unchanged.

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm²,
1 square foot = 0.0929 m²,
1 pound per square foot = 0.0479 kN/m², 1 pound = 0.004448 kN,
1 pound per cubic foot = 16 kg/m³.

- a. Floors in garages or portions of buildings used for the storage of liquid fuel or compressed gas powered motor vehicles shall be designed for the uniformly distributed live loads of this table or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4¹/₂ inches by 4¹/₂ inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.
- b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:
 1. The nominal book stack unit height shall not exceed 90 inches.
 2. The nominal shelf depth shall not exceed 12 inches for each face.
 3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.
- c. Design in accordance with ICC 300.
- d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall be considered where appropriate.
- e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.
- f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.
- g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).
- h. See Section 1604.8.3 for decks attached to exterior walls.
- i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.
- j. Uninhabitable attics with storage are those where the maximum clear height between the joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses.

The live load need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:

 - i. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is not less than 30 inches.
 - ii. The slopes of the joists or truss bottom chords are not greater than two units vertical in 12 units horizontal.

The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.
- k. Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.
- l. Areas of occupiable roofs, other than roof gardens and assembly areas, shall be designed for appropriate loads as approved by the building official. Unoccupied landscaped areas of roofs shall be designed in accordance with Section 1607.13.3.
- m. Live load reduction is not permitted.
- n. Live load reduction is only permitted in accordance with Section 1607.11.1.2 or Item 1 of Section 1607.11.2.

- o. Live load reduction is only permitted in accordance with Section 1607.11.1.3 or Item 2 of Section 1607.11.2.

Reason:

A similar code change proposal was submitted for a definition of a Motor Vehicle. While researching this code change proposal, we determined that most code sections relative to motor vehicles could be broken down into three categories:

1. Code sections dealing with impact protection from operator error.
2. Code sections dealing with fumes related to fuel vapor accumulation related to internal combustion engines that are not being operated.
3. Code sections dealing with fumes related to combustion of the internal combustion engines being operated (exhaust).

We felt that a second definition may help to separate the three issues and bring more clarity into what the issue is with a motor vehicle in each situation. We tried to apply the logic that if the code section is still relevant if the vehicle used is a fully electric golf cart or forklift, then it belongs with all Motor Vehicles...but if the code section only applies if the vehicle is emitting exhaust or fumes from the internal combustion engine, then it would fall into this second proposed definition.

We tried to identify all of the code sections in the IBC where we felt this separate definition would be appropriate. There may be additional reasons to use this definition in the IMC or IFC, but for this code change proposal, we did not pursue those at this time. We feel that each section identified would not make sense if the vehicle described is an electric golf cart or forklift which produces no or minimal exhaust or fumes.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The additional definition is only being provided to assist users of the code when confronted by those code sections that regulate Motor Vehicles, and help to define which types of motor vehicles need to be regulated by each code section. There are no added regulatory provisions.

Internal ID: 2046

G17-18

IBC: 306.2

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Robert Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2018 International Building Code

Revise as follows:

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m²) in area.
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products

- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Wood; distillation
- Woodworking (cabinet)

Reason:

This proposal is a correlation issue with the FCAC IFC Section 1206 ESS rewrite. The FCAC looked at the hazards associated with dedicated use utility type ESS installations covered under the following section and decided that Group F-1 was an appropriate classification. For the most part they will serve the grid scale areas of ESS deployment and large facilities.

(IFC) 1206.7.2 Dedicated use buildings. For the purpose of Table 1206.7 dedicated use ESS buildings shall be classified as Group F-1 occupancies and comply with all the following.

The building shall only be used for ESS, electrical energy generation, and other electrical grid related operations.

Occupants in the rooms and areas containing ESS are limited to personnel that operate, maintain, service, test and repair the ESS and other energy systems.

No other occupancy types shall be permitted in the building.

Administrative and support personnel shall be permitted in areas within the buildings that do not contain ESS, provided:

The areas do not occupy more than 10 percent of the building area of the story in which they are located.

A means of egress is provided from the incidental use areas to the public way that does not require occupants to traverse through areas containing ESS or other energy system equipment.

(Also the administrative support areas are separated from the ESS by a 2 hour fire separation.)

When looking at the group classifications and expected fuel loads the F-1 fits the ESS Dedicated Use Building from that standpoint, especially since Electric Generation Plants are already an F-1 Group. ESS are part of the overall electric generation and storage. If ESS is installed in a building occupied by another group it will remain that Group and be required to have the increased fire protection features for the space the ESS occupies. That does not change from how the current code addresses ESS.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal provides correlation with an IFC proposal. The IFC proposal will actually decrease the cost of construction because it will allow larger ESS installations in dedicated use indoor locations to be in Group F-1 occupancies, rather than in H-2 occupancies.

G18-18

IBC: 306.3

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2018 International Building Code

Revise as follows:

306.3 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including 16-percent alcohol content
- Brick and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)
- Water/sewer treatment facilities

Reason:

Just about every jurisdiction has a water or sewer treatment facility in them. However, many people have difficulty determining the occupancy classification. Therefore, we are proposing that these uses be added to the Group F-2 Occupancy list. These facilities are a low hazard occupancy with the exception of some hazardous materials used in the processing. The code has provisions to handle the use of these hazardous materials. The proposal provides users a clear classification of these facilities and makes it easier to use.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a clarification of the code requirements.

Internal ID: 240

G19-18

IBC: SECTION [F]307.4, [F]307.5

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

SECTION 307 HIGH-HAZARD GROUP H

[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 storage or use and shall comply with the International Fire 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~~ a dust hazard analysis prepared in accordance with Section ~~414.1.3.426.1~~ and NFPA 652.
- Cryogenic fluids, flammable.
- Flammable gases.
- Organic peroxides, Class I.
- Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 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~~ a dust hazard analysis prepared in accordance with Section ~~414.1.3.426.1~~ and NFPA 652.
- Consumer fireworks, 1.4G (Class C, Common)
- Cryogenic fluids, oxidizing
- Flammable solids
- Organic peroxides, Class II and III
- Oxidizers, Class 2
- Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15

pounds per square inch gauge (103 kPa) or less

- Oxidizing gases
- Unstable (reactive) materials, Class 2
- Water-reactive materials, Class 2

Reason:

This proposal is follow up work correlating the IBC and IFC provisions with the work done on Chapter 22 Combustible Dust and Chapter 37 Combustible Fibers in the IFC along with Section 426 of the IBC.

With the addition of NFPA 652 specific requirements are now applicable on how to perform a Dust Hazard Analysis for the purpose of characterizing a dust hazard and identifying building or operational features that need to be addressed to properly manage the hazard.

This proposal points the Combustible Dust and Combustible Fibers hazard classification language to the appropriate standard for developing the necessary information for submittal to the code official. A key hazard of combustible fibers within a building in addition to the fibers is a dust hazard and Chapter 37 Combustible Fibers in the IFC is linked to Chapter 22 Combustible Dust-Producing Operations already at Section 3703.5.

Both IBC Section 426.1 and Chapter 22 of the IFC apply NFPA 652 as the primary standard. Chapter 7 of NFPA 652 contains the requirements for conducting a Dust Hazard Analysis.

By modifying the language it will assist designers and code officials by ensuring a detailed analysis is performed providing information relevant to the specific hazards.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is a correlation based upon updated provisions in the codes. The cost impact should be neutral, though any time the language is improved there is a potential to eliminate unnecessary costs.

Internal ID: 1567

G20-18

IBC: [F] 307.4, [F] 307.5

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

[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 storage or use and shall comply with the International Fire 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.
- Flammable gases.
- Organic peroxides, Class I.
- Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 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
- Flammable solids
- Organic peroxides, Class II and III
- Oxidizers, Class 2

- Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
- Oxidizing gases
- Unstable (reactive) materials, Class 2
- Water-reactive materials, Class 2

Reason:

This proposal is follow up work correlating the IBC and IFC provisions with the work done on Chapter 22 Combustible Dust and Chapter 37 Combustible Fibers in the IFC along with Section 426 of the IBC.

The proposal seeks to delete the listing of dust and combustible fibers from IBC Table 307.1(1) and IFC Table 5003.1.1(1).

The key reason for deleting the listings is because combustible dust is typically not a hazardous material, a small percentage may be, but the dust hazard classification is not a hazardous material issue. The same for combustible fibers.

2018 IBC

“SECTION 307 HIGH-HAZARD GROUP H

[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 storage or use and shall comply with the International Fire Code.”

“[F] HAZARDOUS MATERIALS. Those chemicals or substances that are physical hazards or health hazards as classified in Section 307 and the International Fire Code, whether the materials are in usable or waste condition.”

“[F] HEALTH HAZARD. A classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term “health hazard” includes chemicals that are toxic or highly toxic, and corrosive.”

“[F] PHYSICAL HAZARD. A chemical for which there is evidence that it is a combustible liquid, cryogenic fluid, explosive, flammable (solid, liquid or gas), organic peroxide (solid or liquid), oxidizer (solid or liquid), oxidizing gas, pyrophoric (solid, liquid or gas), unstable (reactive) material (solid, liquid or gas) or water-reactive material (solid or liquid).”

By scoping and definition, Section 307 applies to hazardous materials, chemicals. Combustible dust and combustible fiber hazards are not hazardous material or chemical hazards. So, in applying Section 307 on H Group occupancies you can only apply the requirements to those combustible dusts or combustible fibers that also happen to be chemicals.

The need for the hazardous group listings has been eliminated by work last cycle to update the combustible dust requirements of the code. Combustible fiber language was updated going into the 2015 IFC and that chapter points to the combustible dust chapter.

Previously there appeared to be an option to not mitigate a dust/fiber fire explosion hazard and default to an H Group Occupancy. That is no longer permitted. A facility, new or existing, must test to identify the hazard and then must take measures to manage the hazard.

2018 IBC

“SECTION [F] 426 COMBUSTIBLE DUSTS, GRAIN PROCESSING AND STORAGE

[F] 426.1 General. The provisions of Sections 426.1.1 through 426.1.7 shall apply to buildings in which materials that produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with NFPA 652 and the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664 and the International Fire Code.”

“2018 IFC

SECTION 2201

GENERAL 2201.1 Scope. The equipment, processes and operations involving dust explosion hazards shall comply with the provisions of this code and NFPA 652.”

“SECTION 2203 PRECAUTIONS

2203.1 Owner responsibility. The owner or operator of a facility with operations that manufacture, process, blend, convey, repackage, generate or handle potentially combustible dust or combustible particulate solids shall be responsible for compliance with the provisions of this code and NFPA 652.2203.2 Dust hazard analysis (DHA). The requirements of NFPA 652 apply to all new and existing facilities and operations with combustible dust hazard. Existing facilities shall have a dust hazard analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.

The fire code official shall be authorized to order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis."

With the addition of the new NFPA 652 Standard on the Fundamentals of Combustible Dust as a core requirement in both the IBC and the IFC, currently written the code now requires the identified hazard to be addressed whether in a new or existing facility. This makes a H-2 or H-3 Group designation moot.

The activities will be designated appropriately as an F-1 or an S-1. Several occupancies currently listed in Groups F-1 and S-1 are occupancies that have material that require the assessment of the hazard presented.

During drafting of the proposal it was argued that the H-2 and H-3 classifications must remain because they are needed for a potential deflagration even though the codes now require the hazard to be managed because a deflagration could occur in case something goes wrong, or the code is not followed. The claim is that the H Group is a fail safe requirement. This argument is not supported by current code provisions where activities are not classified as high hazard currently in addition to the fact that the combustible dust hazards and combustible fiber hazards are not regulated by the scoping of Section 307 of the IBC or Chapter 50 of the IFC.

Section [F] 307.1.1 Uses other than Group H of the IBC has a laundry list of activities that are not to be classified as a Group H provided they comply with the codes otherwise that could present deflagration hazards if something goes wrong or the code is not complied with.

"1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the International Fire Code."

A major hazard of flammable finishes is a deflagration. In many finish application activities you are creating the hazard by volatilizing the product. This is addressed through engineering controls and ignition hazard controls and in exchange for those code required controls they are not classified as an H-2 in case things go wrong or the code is not followed. The assumption is that the code will be followed.

"3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment."

If the material is enclosed in piping we automatically exclude the H Group regardless of amounts present. Even though we know a leak can cause a deflagration hazard, (and has). We assume code compliance addresses the safety issues.

"7. Refrigeration systems."

Even if the systems utilize flammable gas as a refrigerant, (actually this exception is because of the use of flammable gas as a refrigerant), which will cause a deflagration hazard if they leak. (And there have been deflagrations). The assumption is that the code will be followed.

"14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code."

Again, we assume code compliance addresses the hazard.

Laboratories are a Group B even though they can have flammable gases or liquids present sufficient to cause a deflagration hazard if released.

The quantities of materials in Tables 5003.1.1(1) and IBC Table 307.1(1) do not consider deflagration potentials. If they did, the amount of material permitted would be tied directly to the size of the space and additional levels of protection for even the smallest amounts.

Based upon analysis, a single-family garage can be destroyed by a cup of gasoline that is fully volatilized and an ignition source is introduced. Yet we permit up to 30 gallons of flammable liquid to be present in any occupancy under the MAQ tables, 60 gallons if we provide sprinkler protection even though sprinkler protection has nothing to do with preventing a deflagration or mitigating its effects other than the post fire event potential. The fire code allows flammable liquid quantities beyond that needed for a deflagration to occur even in residential occupancies.

2018 IFC

"5704.3.4.2 Occupancy quantity limits. The following limits for quantities of stored flammable or combustible liquids shall not be exceeded:...

7. Group R occupancies: Quantities in Group R occupancies shall not exceed that necessary for maintenance purposes and operation of equipment, and shall not exceed quantities set forth in Table 5003.1.1(1)."

The same analogy can be used for the amount flammable gases permitted in a given space.

The removal of the H Group designations removes language that cannot be applied in most cases because the combustible dust or combustible fiber is not a hazardous material or chemical.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal recognizes improvement of the language in the IBC and IFC that occurred the last two cycles addressing the hazards presented by these activities. The net effect would be that a reduction is possible anytime the code is clarified and correlated eliminating unnecessary designations.

Internal ID: 1557

G21-18

IBC: 310.2

Proponent: Daniel Willham, County of Fairfax, Virginia, representing Virginia Building and Code Officials Association (VBCOA) (daniel.willham@fairfaxcounty.gov)

2018 International Building Code

Revise as follows:

310.2 Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* or more than two dwelling units where the occupants are primarily *transient* in nature, including:

- *Boarding houses (transient)* with more than 10 occupants
- *Congregate living facilities (transient)* with more than 10 occupants
- *Hotels (transient)*
- *Motels (transient)*

Reason:

There appears to be a gap in the code for hotels (transient) that provide dwelling units. As currently written, neither the R-1 nor the R-2 descriptions provide clear direction on the classification of hotels (transient) that provide dwelling units. The commentary clarifies that R-1 occupancies can contain either sleeping units, dwelling units, or both, but the code as written does not explicitly address transient residential occupancies that contain (more than two) dwelling units. The key characteristic of group R-1 occupancies is the transient nature of the occupants and not the absence of dwelling units. This proposal simply adds language for dwelling units that mirrors that used in the description of R-2 non-transient occupancies. With this clarification, the difference between R-1 and R-2 occupancies will be clearly defined to depend only on the transient or non-transient nature of the occupants, respectively. For reference, an excerpt from the IBC commentary (pg3-37) follows this change proposal.

living facilities are also classified as Group R. Specifically, these facilities are classified as Group R-4. Mainstreaming people who are recovering from alcohol or drug addiction and people who are developmentally disabled is reported to have therapeutic and social benefits. A residential environment often fosters this mainstreaming.

A building or part of a building is considered to be a residential occupancy if it is intended to be used for sleeping accommodations (including assisted living facilities) and is not an institutional occupancy. Institutional occupancies are similar to residential occupancies in many ways. However, they differ from each other in that institutional occupants are in a supervised environment, and, in the case of Groups I-2 and I-3 occupancies, are under some form of restraint or physical limitation that makes them incapable of complete self-preservation. The number of these occupants who are under supervision or are incapable of self-preservation is one distinguishing factor for being classified as an institutional or residential occupancy.

The term Group R refers collectively to the four individual residential occupancy classifications: Groups R-1, R-2, R-3 and R-4. These classifications are differentiated in the code based on the following criteria: 1. Whether the occupants are transient or nontransient in nature; 2. The type and number of dwelling units or sleeping units contained in a single building; and 3. The number of occupants in the facility.

310.2 Definitions. The following terms are defined in Chapter 2:

BOARDING HOUSE.
CONGREGATE LIVING FACILITIES.
DORMITORY.
GROUP HOME.
GUEST ROOM.
LODGING HOUSE.
PERSONAL CARE SERVICE.
TRANSIENT.

◆ This section lists terms that are specifically associated with the subject matter of this section. It is important to emphasize that these terms are not exclusively related to this section but may or may not also be applicable where the term is used elsewhere in the code.

Definitions of terms can help in the understanding and application of the code requirements. The purpose for including a list within this chapter is to provide more convenient access to terms which may have a specific or limited application within this chapter. For the complete definition and associated commentary, refer back to Chapter 2. Terms that are italicized provide a visual identification throughout the code that a definition exists for that term. The use and

application of all defined terms are set forth in Section 201.

310.3 Residential Group R-1. Residential Group R-1 occupancies containing sleeping units whose the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants
Congregate living facilities (transient) with more than 10 occupants
Hotels (transient)
Motels (transient)

◆ The key characteristic of Group R-1 that differentiates it from other Group R occupancies is that the occupants are considered transient in nature (i.e., those whose length of stay is not more than 30 days). There is an expectation that the occupants are not as familiar with the building as those residents in nontransient facilities such as apartment buildings and single-family dwellings. If occupants are unfamiliar with their surroundings, they may not recognize potential hazards or be able to use the means of egress effectively.

The most common building types classified in Group R-1 are hotels, motels and boarding houses. Facilities classified as Group R-1 occupancies may include dwelling units, sleeping units, or a combination of both. Group R-1 occupancies do not typically have cooking facilities in the unit. When a unit is not equipped with cooking facilities, it does not meet the definition of a "dwelling unit" in Section 202. When this occurs, such units are treated as sleeping units for the application of code provisions (see Commentary Figure 310.3). A recent trend in development is the construction of "extended-stay hotels." While these units may have all of the characteristics of a typical dwelling unit (i.e., cooking, living, sleeping, eating, sanitation), the length of stay is still typically not more than 30 days. As such, these buildings would still be classified as Group R-1. If the length of stay is more than 30 days, these buildings would be classified as Group R-2. If a hotel offers rooms for short-term housing (i.e., more than 30 days), the facility must comply with the provisions for both Groups R-1 and R-2 (see Section 302.1).

Other occupancies are often found in buildings classified in Group R-1. These occupancies include nightclubs (Group A-2), restaurants (Group A-2), gift shops (Group M), business offices (Group B), health clubs (Group A-3) and storage facilities (Group S-1). When this occurs, the building is a mixed occupancy and is subject to the provisions of Section 508.

Transient congregate living facilities and boarding houses with 10 or fewer occupants can be constructed to the standards of Group R-3 occupancies rather than the general category of Group R-1. The primary intent of this provision is to permit bed-and-breakfast-type facilities to be established in existing single-family (one-family) structures. In comparison to the provision under Group R-2 which permits congregate living facilities with fewer than 16 nontransient

Bibliography:

2015 IBC Code and Commentary, Volume 1, International Code Council, 2015, pg. 3-37.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a clarification which will not affect construction cost.

Internal ID: 1049

G22-18

IBC: 310.4.2

Proponent: Jeffrey Shapiro, representing IRC Fire Sprinkler Coalition (jeff.shapiro@intlcodeconsultants.com)

2018 International Building Code

Revise as follows:

310.4.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

310.4.2 Lodging houses. Owner-occupied *lodging houses* with five or fewer *guest rooms* and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

Reason:

Correlation with the format of Section 310.5.1 (which is shown without change for reference) and IRC Section 101.2 Exception 2. Application of 310.5.1 and 310.5.2 with respect to the IRC reference is identical, and it makes not sense for one section to properly include the correlating text and the other to not include it. The allowance to skip the IBC and use the IRC for small lodging houses is only applicable where sprinklers are provided, and this change will clarify that you can't go to the IRC without including sprinklers.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Sprinklers are already required in these occupancies. The change will help to avoid misapplication of the codes and does not add a new mandate.

Internal ID: 2384

G23-18 Part I

IBC: 311.2, 311.3

Proponent: Jason Albers, representing Eden Prairie Fire Department (jalbers@edenprairie.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE GENERAL CODE DEVELOPMENT COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Building Code

Revise as follows:

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosol products, Levels 2 and 3

Aircraft repair hangar (~~storage and repair~~)

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of

Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for

the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Aircraft hangar fixed base operator (FBO)
- Asbestos
- Beverages up to and including 16-percent alcohol in metal, glass or ceramic containers
- 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
- Parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

G23-18 Part II

IFC: 914.8.3; IBC: [F] 412.3.6

Proponent: Jason Albers, representing Eden Prairie Fire Department (jalbers@edenprairie.org)

2018 International Fire Code

914.8.3 Fire suppression for aircraft hangars. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 914.8.3.

~~**Exception:** Where a fixed base operator has separate repair facilities on site, Group II hangars operated by a fixed base operator used for storage of transient aircraft only shall have a fire suppression system, but the system shall be exempt from foam requirements. Group II hangars as defined in NFPA 409 storing private aircraft without major maintenance or overhaul are exempt from foam suppression requirements.~~

2018 International Building Code

Revise as follows:

[F] 412.3.6 Fire suppression. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 412.3.6.

~~**Exception:** fixed base operator has separate repair facilities on site, Group II hangars operated by a fixed base operator used for storage of transient aircraft only shall have a fire suppression system, but the system is exempt from foam requirements. Group II hangars as defined in NFPA 409 storing private aircraft without major maintenance or overhaul are exempt from foam suppression requirements.~~

Reason:

If you follow the history of how we got to where we are today from the introduction of high expansion foam in airplane hangars, you will see that the original intent was to suppress fire under aircraft with expansive wing spans that would otherwise shelter the fire from overhead sprinkler heads. In 2009 there were two changes to the International fire code that directly impacted small municipal airports and the ability to build group II hangars without foam suppression.

A group II hangar as defined by NFPA 409 states the aircraft access door shall be 28 ft. or less and a single fire area between 20,000-40,000 square feet. 914.8.3 Made fixed base operators (FBO) in group II hangars require foam systems and made it exempt for hangars with transient aircraft. Prior to 2009 the language found in these sections allowed for group II hangars with fixed based operators to be exempt from foam requirements.

The occupancy classification also changed in 2009 putting all aircraft into the S-1 category. Prior to 2009 there were two separate classifications S-1 was for aircraft repair hangars and S-2 was all other aircraft hangars. It should be noted that automobile parking garages (open and closed) has remained an S-2 and did not change in 2009. The argument for changing the fixed base operator S-2 to an S-1 is due to the fuel stored in the wings of the aircraft. For comparison the auto ignition temperature of gasoline is 475 F and Jet fuel is 410 F making the fuels of concern very similar in nature, yet enclosed parking garages are protected by wet/dry fire sprinkler systems even though the fuel capacity at many parking garages far exceeds what is stored in the wings of an airplane.

Research:

Research on this subject was difficult to obtain, with that being said I could locate very little research that would have been sufficient to support change to the wording in 2009 either. Most of the research I was able to locate was over a decade old and conducted primarily by the Navy and Air Force. According to a study called Aircraft Hangar Fire Suppression Design Study by Scheffey and Wakelin (June 16, 2000) "All DoD service branches have been plagued with false activations involving foam-water deluge sprinkler systems over aircraft with open cockpits. These false activations have been caused by numerous sources including: lightning strikes which introduced transient voltage spikes into the fire alarm system; water hammers in aging underground water distribution systems; accidental releases by maintenance personnel; deliberate acts of vandalism; accidental activation of manual pull stations; failure of pressure relief valves at pumping stations; roof water leakage into overhead heat detection systems and, false activation of fire detection systems. This prompted all branches of DoD to pursue alternative fire protection designs, which would provide the desired level of protection." Furthermore the study continues to explore the cost of installing, operating, re-charging and maintaining these expensive systems.

Both the Air Force and Navy are looking for ways to remove or improve high-expansion foam in their hangars. The two services (Air Force, Navy) with highest potential for dollar loss are looking for ways to remove foam systems, yet the fire code is forcing privately owned hangars to comply with an un-necessary suppression system.



Bibliography:

Aircraft Hangar Fire Suppression Design Study Scheffey and Wakelin 2000

High Cost of Hangar System Discharge Johnson 2014 <http://thecodecoach.blogspot.com/2014/11/high-cost-of-hangar-system-discharge.html>

Cost Impact

The code change proposal will decrease the cost of construction .

Who would be impacted?

The groups that are affected by the current requirement of foam systems and the groups that will be affected if the language is changed, is significant. First, keeping foam systems as they are currently required in the IFC has a substantial impact on fixed base operators from a financial perspective as well as the employees from a safety perspective. Financially, the installation of high-expansion foam has a substantial cost, exceeding \$250,000 in many cases for the initial design and installation. I have recently been personally involved with the plan review and installation of a foam system with wet sprinklers and the cost exceeded \$400,000. The continued annual maintenance and inspections of these systems also has a substantial financial burden. The highest financial burden comes from lost business or inability to use airplanes that were affected by a discharge. Any plane that is exposed to a discharge can take up to six months to get flying again and many of the systems need to be replaced. (Johnson 11/5/14 <http://thecodecoach.blogspot.com/2014/11/high-cost-of-hangar-system-discharge.html>) Furthermore, in at least one case an employee of an FBO has died in an accidental discharge event of high-expansion foam. From the standpoint of the local municipality who has this type of hangar in their jurisdiction, there becomes a new topic that has to be trained on. This added training will add costs to the training budgets as well as additional inspections from the AHJ. In turn this becomes an additional cost to the FBO as well as the local fire department.

Internal ID: 3490

G24-18

IBC: 311.3

Proponent: Lawrence Cousin, representing Self

2018 International Building Code

Revise as follows:

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 alcohol in metal, glass or ceramic containers
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Electrical room
- 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
- Mechanical room
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Reason:

This will ease the use of Tables in which Mechanical/Electrical room needs to be classified as Low-hazard storage (S-2) and benefit from the relief afforded by the code. A case in point is trying to increase the egress distance from Mechanical room to outside of a school building. The distance is restricted, but became generous when the Mechanical/Electrical room is interpreted as housing storage (S-2) materials.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

By adding a mechanical room and electrical room to S-2 occupancy it does not change how the room is constructed. The code still has requirements for how the room is constructed based on size or amps of equipment.

Internal ID: 1281

G25-18

IBC: 312.1

Proponent: Todd Christopher, Salt Lake City Corporation, representing self (todd.christopher@slcgov.com)

2018 International Building Code

Revise as follows:

312.1 General. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- Agricultural buildings
- Aircraft hangars, accessory to a one- or two-family residence (see Section 412.4)
- Barns
- Carports
- Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m²)
- Fences more than ~~6-7~~ feet (~~1829-2134~~ mm) in height
- Grain silos, accessory to a residential occupancy
- Livestock shelters
- Private garages
- Retaining walls
- Sheds
- Stables
- Tanks
- Towers

Reason:

IBC Section 105.2 indicates that fences not over 7 feet in height are exempt from permits. IBC Section 312.1 indicates that fences more than 6 feet in height are to be considered as a Group U occupancy, therefore subject to current code requirements. It seems these two code sections should be consistent. The code requirements for a Group U occupancy cannot be enforced upon a 6 foot tall fence where fences not more than 7 feet in height are exempt.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

No perceived impact to construction cost.

Internal ID: 2026

G26-18

IBC: [F] 402.7.2

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS

Revise as follows:

[F] 402.7 Emergency systems. *Covered and open mall buildings, anchor buildings and associated parking garages shall be provided with emergency systems complying with Sections 402.7.1 through 402.7.5.*

[F] 402.7.2 Smoke control. ~~Where a covered mall building contains an atrium, Atriums connecting three or more stories in covered mall buildings shall be provided with a smoke control system shall be provided in accordance with Section 909.404.5~~

~~**Exception:** A smoke control system is not required in covered mall buildings where an atrium connects only two stories.~~

Reason:

This proposal simply makes a more direct reference to the need for a smoke control system instead of sending the reader to Section 404.5 and through the exception. The technical requirements do not change. Smoke control is only required where an atrium connects 3 or more stories whether associated with a covered mall or other type of building.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal simply makes the provisions more direct as to when smoke control would be required in a covered mall building.

Internal ID: 185

G27-18

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Delete without substitution:

~~**403.2.2 Seismic considerations.** For seismic considerations, see Chapter 16.~~

Reason:

This proposal deletes the existing pointer to Chapter 16 for seismic considerations. The existing pointer was useful when Chapter 16 substantially copied seismic design requirements from ASCE 7, including direction on which seismic design methods were applicable to high-rise buildings and limitations on lateral force-resisting systems for buildings of certain heights in certain seismic design categories. All of that information with the exception of the basic information needed for a building official to verify the seismic ground motions and seismic design category has been removed from Chapter 16 and replaced with references to ASCE 7. Thus, the pointer is no longer needed.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction.

This is an editorial clarification and will therefore not increase or decrease the cost of construction.

Internal ID: 171

G28-18

IBC: [F] 403.3.2; IFC: 914.3.1.2

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

THIS CODE CHANGE PROPOSAL WILL BE HEARD BY THE IFC COMMITTEE. PLEASE CONSULT THE AGENDA FOR THE IFC COMMITTEE.

2018 International Building Code

Revise as follows:

[F] 403.3.2 Water supply to required fire pumps. In all buildings that are more than 420 feet (128 m) in building height, and buildings of Type IVA and IVB construction that are more than 120 feet in building height, required fire pumps shall be supplied by connections to not fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.

2018 International Fire Code

914.3.1.2 Water supply to required fire pumps. In all buildings that are more than 420 feet (128 m) in building height, and buildings of Type IVA and IVB construction that are more than 120 feet in building height, required fire pumps shall be supplied by connections to not fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The Ad Hoc Committee has discussed a number of proposals to potentially increase the permitted height and area for Type IV structures, specifically mass timber buildings adding additional Types IVA, IVB & IVC. One of the basic requirements incorporated into these proposed increased heights and areas is the added active and passive protection features to these structures.

The Code Technology Committee, in response to the events of September 11, 2001, submitted proposals for water supply to super high-rise buildings of 420' and higher. This requirement was adopted due to the recognized importance of insuring a continuous water supply to the active fire protection systems in the event of a fire in these structures. This recommendation was highlighted in the National Institute of Standards and Technology's (NIST) report on the structural collapses on September 11th.

This code change proposal brings this same concept to Type IV structures of 120' and higher. This added protection feature would be unique to Type IVA and IVB construction (as proposed in a related code change - see table below) due to the potential contribution of the mass timber to the fuel load in the event of a fire. Due to the limitations of fire service aerial apparatus' ability to apply water to elevated floors the Ad Hoc Committee felt 120' was an appropriate height to initiate the requirement. Another consideration is that currently the code permits structures up to 85' so the committee identified the next level within the codes for additional requirements. Considerations were also given to the difficulty of fire service companies accessing elevated floors under fire conditions.

The Ad Hoc Committee has proposed greater permitted heights and areas of mass timber construction than those contained in the 2018 IBC. The Ad Hoc believes this code change proposal is an important component to these proposed increased heights and areas. If the permitted heights and areas of mass timber construction are raised it is imperative we adopt related code change proposals to insure the reliable performance of active and passive protection features to insure the safety of occupants and responding fire fighters.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 959

G29-18

IBC: 403.5.6

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Delete without substitution:

~~**403.5.6 Emergency escape and rescue.** Emergency escape and rescue openings specified in Section 1030 are not required.~~

Reason:

EERO not required for high-rises in Section 1030.1, so the exception not needed in the high-rise provisions in Section 403.

This is one of a series of 11 proposals to coordinate the Emergency Escape and Rescue Openings (EERO) technical criteria in the I-codes. Please see the proposal for the definition of Emergency Escape and Rescue Openings for additional information.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/codedevelopment-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no requirement or change in technical criteria for construction.

Internal ID: 457

G30-18

IBC: 404.1

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

2018 International Building Code

Revise as follows:

404.1 General. In other than Group H occupancies, ~~and where permitted by Section 712.1.7~~, the provisions of Sections 404.1 through 404.10 shall apply to buildings or structures containing vertical openings defined as "Atriums."

Exception: Vertical openings that comply with Sections 712.1.1 through 712.1.3, and Sections 712.1.9 through 712.1.14.

Reason:

Regardless of the number of changes that people make to Section 404 (Atriums) and Section 712 (Vertical Openings), and the countless words the IBC Commentary uses to help the code user, numerous people still do not fully comprehend that the provisions found in Section 404 are NOT the only way allowed to protect a 2-story large "hole" in a floor/ceiling assembly in a building that only has 2 stories, i.e., a hole intended to allow daylight to move to another story.

In the IBC the construction of a floor/ceiling assembly is regulated by Section 711 (Floor and Roof Assemblies). And though not defined, in the IBC any "hole" in a floor ceiling assembly is considered to be a "vertical opening." Sorry to give a mini-seminar but it seems like people don't know that Section 711 specifically tells the code user that regardless of whether or not a floor/ceiling assembly has a fire rating, the continuity rule says "Assemblies shall be continuous without vertical openings, except as permitted by this section and Section 712.

Section 712 (Vertical Openings) contains 16 means by which "holes" in floors can be addressed. For a large "hole" in a floor/ceiling assembly that is intended to allow daylight to move to another story, Section 712 really offers only 2 options:

712.1.7 – Atriums (Section 404)

712.1.9 – Two-story openings

Even a new code user knows that if a word or term is italicized then there is a definition of the term in Chapter 2. And in reading Section 712.1.7 they will see that the term "atrium" is italicized. So off to Chapter 2 they go where they find the following definition – "**ATRIUM.** An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505."

The "hole" outlined above meets the definition of "atrium" so hey, they are done – they know that it must be protected as outlined in Section 404. They NEVER got to the 2nd option in 712.1.9.

Several cycles ago, the 1st sentence in Section 404.1 was added to tell the code user that they only should have gotten to Section 404 through the use of Section 712.1.1, but based upon the number of questions I receive as a code consultant to architects, engineers, designers, owners, developers and even code official each year on this topic – this pointer has not worked.

Through the elimination of the pointer to Section 712.1.7 and the addition of the exception, this code change is intended to make it clear that not all 2-story vertical openings must comply with Section 404, but that the design option found in 712.1.9 IS ALWAYS another option.

Cost Impact

The code change proposal will increase the cost of construction .

If accepted the cost of construction may be decreased as not all of the provisions for an atrium will have to be included.

Internal ID: 2165

G31-18

IBC: 404.1, 404.9, 404.9.1, 404.9.2, 404.9.3, 404.10, 712.1.7, TABLE 1017.2, 1017.3.2 (New), 1017.3.2.1 (New), 1017.3.2.2 (New), 1017.3.2.3 (New), 1028.1, (IFC[BE] TABLE 1017.2, 1017.3.2 (New), 1017.3.2.1 (New), 1017.3.2.2 (New), 1017.3.2.3 (New), 1028.1)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows:

404.1 General. In other than Group H occupancies, and where permitted by Section 712.1.7, the ~~The~~ provisions of Sections 404.1 through 404.10 shall apply to buildings containing atriums. Atriums are not permitted in buildings or structures containing vertical openings defined as "Atriums."classified as Group H.

404.9 Exit access travel distance. *Exit access* travel distance for areas open to an *atrium* shall comply with the requirements of ~~this section.~~Section 1017.

Delete without substitution:

~~**404.9.1 Egress not through the atrium.** Where required access to the exits is not through the *atrium*, *exit access* travel distance shall comply with Section 1017.~~

~~**404.9.2 Exit access travel distance at the level of exit discharge.** Where the path of egress travel is through an *atrium* space, *exit access* travel distance at the *level of exit discharge* shall be determined in accordance with Section 1017.~~

~~**404.9.3 Exit access travel distance at other than the level of exit discharge.** Where the path of egress travel is not at the *level of exit discharge* from the *atrium*, that portion of the total permitted *exit access* travel distance that occurs within the *atrium* shall be not greater than 200 feet (60 960 mm).~~

Revise as follows:

404.10 Interior exit stairways. Not greater than 50 percent Discharge of *interior exit stairways* are permitted to egress through an atrium ~~on the *level of exit discharge* shall be~~ in accordance with Section 1028.

712.1.7 Atriums. In other than Group H occupancies, atriums complying with Section 404 shall be permitted. Atriums in buildings shall comply with Section 404.

**TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200 ^e	250 ^b
I-1	Not Permitted	250 ^b
B	200	300 ^c
F-2, S-2, U	300	400 ^c
H-1	Not Permitted	75 ^d
H-2	Not Permitted	100 ^d
H-3	Not Permitted	150 ^d
H-4	Not Permitted	175 ^d
H-5	Not Permitted	200 ^c
I-2, I-3	Not Permitted	200 ^c
I-4	150	200 ^c

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to *exit access* travel distance requirements:

Section 402.8: For the distance limitation in malls.

~~Section 404.9: For the distance limitation through an atrium space.~~

Section 407.4: For the distance limitation in Group I-2.

Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.

Section 411.3: For the distance limitation in special amusement buildings.

Section 412.6: For the distance limitations in aircraft manufacturing facilities.

Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.

Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.

Section 1006.3.3: For buildings with one exit.

Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.

Section 1029.7: For increased limitation in assembly seating.

Section 3103.4: For temporary structures.

Section 3104.9: For pedestrian walkways.

- b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.
- c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
- d. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.1.
- e. Group R-3 and R-4 buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

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

Exception: In open parking garages, *exit access* travel distance is permitted to be measured to the closest riser of an *exit access stairway* or the closest slope of an *exit access ramp*.

1017.3.1 Exit access stairways and ramps. Travel distance on *exit access stairways* or *ramps* shall be included in the *exit access* travel distance measurement. The measurement along *stairways* shall be made on a plane parallel and tangent to the *stair tread nosings* in the center of the *stair* and landings. The measurement along *ramps* shall be made on the walking surface in the center of the *ramp* and landings.

Add new text as follows:

1017.3.2 Atriums. Exit access travel distance for areas open to an atrium shall comply with the requirements of this section.

1017.3.2.1 Egress not through the atrium. Where required access to the exits is not through the atrium, exit access travel distance shall comply with Section 1017.2.

1017.3.2.2 Exit access travel distance at the level of exit discharge. Where the path of egress travel is through an atrium space, exit access travel distance at the level of exit discharge shall be determined in accordance with Section 1017.2.

1017.3.2.3 Exit access travel distance at other than the level exit discharge. Where the path of egress travel is not at the level of exit discharge from the atrium, that portion of the total permitted exit access travel distance that occurs within the atrium shall be not greater than 200 feet (60 960 mm).

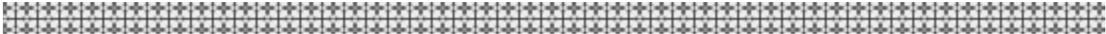
Revise as follows:

1028.1 General. Exits shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct path of egress travel to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required exits.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of *interior exit stairways* and *ramps* is permitted to egress through areas, including atriums, on the level of discharge provided that all of the following conditions are met:
 - 1.1. Discharge of *interior exit stairways* and *ramps* shall be provided with a free and unobstructed path of travel to an exterior *exit* door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.
 - 1.2. The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the *fire-resistance rating* for the enclosure.
 - 1.3. The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. Portions of the *level of exit discharge* with access to the egress path shall be either equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.
 - 1.4. Where a required *interior exit stairway* or *ramp* and an *exit access stairway* or *ramp* serve the same floor level and terminate at the same *level of exit discharge*, the termination of the *exit access stairway* or *ramp* and the *exit discharge* door of the *interior exit stairway* or *ramp* shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the *exit discharge* door from the *interior exit stairway* or *ramp* and the last tread of the *exit access stairway* or termination of slope of the *exit access ramp*.
2. Not more than 50 percent of the number and minimum width or required capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided that all of the following conditions are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* of the *interior exit stairway* or *ramp enclosure*.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the *level of exit discharge* by a *fire partition* constructed in accordance with Section 708.

Exception: The maximum transmitted temperature rise is not required.


 - 2.4. The area is used only for *means of egress* and exits directly to the outside.
3. *Horizontal exits* complying with Section 1026 shall not be required to discharge directly to the exterior of the building.

Reason:

The purpose of this proposal is to relocate portions of the Section 404 atrium requirements to other appropriate portions of the IBC. As defined in Chapter 2, an atrium is a particular type of a vertical opening in a building or structure, but not the only method permitted by Chapter 7 for dealing with a vertical opening. A proposal last cycle (G51-15) attempted to relocate the entire Section 404 provisions into Section 712. While the proposal was disapproved by a vote of 8-6, there was support expressed for considering a relocation of these provisions if clarifications to the existing text were provided and at least a minimum set of provisions be retained in Chapter 4 as a starting point for addressing requirements specific to certain building features. This proposal retains Section 404 but makes some targeted relocations. In all cases, pointers are left in Section 404 so the link is not totally lost and code users still have Section 404 as a guide to all of the considerations for atriums. Requirements relative to exit access travel distance and interior exit stair discharge are also moved to Section 1017 and Section 1028 respectively. While these provisions perhaps appear specific to atriums, they are not entirely self-contained and clearly need to be evaluated as part of the general travel distance and exit discharge requirements for the building. For exit access travel distance, the

atrium-specific provisions are added under the exiting Section 1017.3 on measurement of exit access travel distance. For exit discharge, a reference to atriums is added under Exception #1 of Section 1028.1. Finally, the charging language is clarified. A circular reference between Section 404 and Section 712.1 is removed. The existing language, especially in Section 404, also makes it vague as to whether an atrium is allowed in a Group H building or structure, versus another method of treating a vertical opening. The implication (especially in Section 712.1) is that such an atrium is not permitted. The charging language in both sections is revised accordingly. In addition, an exception is added permitting a vertical opening meeting the definition of an atrium to be constructed in accordance with any of the other methods for treating a vertical opening (e.g. a shaft enclosure per Section 712.1.1 or a generic two-story opening per Section 712.1.9).

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code change proposal will not increase or decrease the cost of construction. This is an editorial reorganization to place requirements in a more appropriate location.

Internal ID: 174

G32-18

IBC: 404.5

Proponent: Sarah Rice, representing Myself (srice@preview-group.com)

2018 International Building Code

Revise as follows:

404.5 Smoke control. A smoke control system shall be installed in accordance with Section 909.

Exception-Exceptions:

1. In other than Group I-2, and Group I-1, Condition 2, smoke control is not required for *atriums* that connect only two stories.
2. A smoke control system is not required for atriums connecting more than two stories when all of the following are met:
 - 2.1. Only the 2 lowest stories shall be permitted to be open to the atrium.
 - 2.2. All stories above the lowest 2 stories shall be separated from the atrium in accordance with Section 404.6.

Reason:

As stated in Section 909, the purpose of a smoke control systems is to provide a tenable environment for the evacuation or relocation of occupants. A smoke control system is NOT intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems that are required and regulated by the IBC serve a different purpose than the smoke- and heat-venting provisions found in Section 910 and they are not considered exhaust systems under Chapter 5 of the International Mechanical Code.

In an atrium that connects more than 2 stories, the smoke control systems is intended to maintained the height of the lowest horizontal surface of the smoke layer interface to at least 6 feet above any walking surface that forms a portion of a required egress system within the smoke zone for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

But what if the only walking surfaces in the atrium are on the 2 lowest stories of the atrium? What if all the walls above the 2 lowest stories are solid without operable openings? What purpose does the smoke control system then serve? We contend none. And if the smoke control system has no real value, then why install it? See Figures 1 - 3 for examples of these spaces.

This proposed change seeks to exempt atriums that connect more than 2 stories from having to have a smoke control system when 1) there are no walking surfaces in the atrium above the 2 lowest stories and 2) there are no operable windows or doors above the 2 lowest stories in the atrium and 3) the walls of the atrium on the upper levels are constructed per Section 404.6 - atrium enclosures..





Cost Impact

The code change proposal will decrease the cost of construction .

The cost savings of not providing smoke control system in a building with an atrium will decrease the cost of construction.

Internal ID: 2381

G33-18

IBC: 404.6

Proponent: Raymond Grill, representing Self (ray.grill@arup.com)

2018 International Building Code

Revise as follows:

404.6 Enclosure of atriums. *Atrium* spaces shall be separated from adjacent spaces by a 1-hour *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both.

Exceptions:

1. A *fire barrier* is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:
 - 1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the *atrium* side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;
 - 1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
 - 1.3. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic-closing.
2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 and having a $\frac{3}{4}$ -hour *fire protection rating* is provided.
3. A *fire barrier* is not required between the *atrium* and the adjoining spaces of up to three floors of the *atrium* provided that such spaces are accounted for in the design of the smoke control system.
4. A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.
5. A horizontal assembly is not required between the atrium and openings for escalators complying with Section 712.1.3.
6. A horizontal assembly is not required between the atrium and openings for exit access stairways and ramps complying with 1019.3.4.

Reason:

Floor openings for escalators and exit access stairways and ramps meeting the sections identified in the proposal are protected. The protection consists of draft curtains around the floor opening and additional sprinklers. The size of the floor opening is also limited. The provision of the draft curtain and sprinklers limit the potential of smoke spread through the opening and that communicate via these types of openings should not be considered to be part of the atrium.

Cost Impact

The code change proposal will decrease the cost of construction .

If levels that are connected via protected escalator or access stairway or ramp openings are considered part of the atrium, there are potentially significant costs associated with providing smoke control for those levels.

Internal ID: 2277

G34-18

IBC: 202, (New), 404.6, 716.4 (New), 716.4.1 (New), 716.4.2 (New), 716.4.3 (New), Chapter 35

Proponent: Tessa Quinones, The Hickman Group, representing Smoke Guard (admin@thehickmangroup.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

SECTION 202 DEFINITIONS

FIRE PROTECTIVE CURTAIN ASSEMBLY. An assembly consisting of a fabric curtain, bottom bar, guides, coil, operating, and closing system.

404.6 Enclosure of atriums. *Atrium* spaces shall be separated from adjacent spaces by a 1-hour *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both.

Exceptions:

1. A *fire barrier* is not required where a glass wall forming a smoke partition or a 20-minute fire protective curtain assembly is provided. The glass wall or fire protective curtain assembly shall comply with all of the following:
 - 1.1. Automatic sprinklers are provided along both sides of the separation wall, fire protective curtain assembly and doors, or on the room side only if there is not a walkway on the *atrium* side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass or fire protective curtain assembly not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass or fire protective curtain assembly is wet upon activation of the sprinkler system without obstruction;
 - 1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
 - 1.3. The fire protective curtain assembly shall be installed in accordance with Section 716.4 and shall be actuated in conjunction with the atrium smoke control system, and
 - ~~1.3.1.4.~~ Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic-closing.
2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 and having a $\frac{3}{4}$ -hour *fire protection rating* is provided.
3. A *fire barrier* is not required between the *atrium* and the adjoining spaces of up to three floors of the *atrium* provided that such spaces are accounted for in the design of the smoke control system.
4. A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.

Add new text as follows:

716.4 Fire protective curtain assembly. Approved fire protective curtain assemblies shall be constructed of any materials or assembly of component materials tested without hose stream in accordance with UL 10D, and shall comply with the Sections 716.4.1 through 716.4.3

716.4.1 Label. Fire protective curtain assemblies used as opening protectives in fire rated walls and smoke partitions shall be labeled in accordance with Section 716.2.9.

716.4.2 Smoke and draft control. Fire protective curtain assemblies used to protect openings where smoke and draft control assemblies are required shall comply with Section 716.2.1.4.

716.4.3 Installation. Fire protective curtain assemblies shall be installed in accordance with NFPA 80.

Add new standard(s) follows:

10D-14:

Standard for Fire Tests of Fire Protective Curtain Assemblies

Reason:

During the last cycle, FS 102-15 was disapproved at least in part on the proposed use of fabric fire protective curtain assemblies as an opening protective having a one-hour fire protection rating and to replace one hour fire barriers. This proposal allows the use of a 20-minute fire protective curtain assembly as an alternative to a non-rated glass wall when protected with sprinklers for the enclosure of an atrium. In addition, the proposal allows fire protective curtain assemblies as an opening protective as permitted by other sections of the IBC.

Both of these applications are consistent with the scope of UL 10D which reads:

These requirements cover the evaluation of fire protective curtain assemblies intended to provide supplemental passive fire protection as part of an engineered fire protection system. Fire protective curtain assemblies provide nonstructural separation only, and are not intended to be substituted for structural hourly rated partitions or opening protectives that have been tested for fire endurance and hose stream performance.

The proposed definition and uses are consistent with NFPA 80-2016 and UL 10D. Some products can also pass UL 1784 for an "S" label.

The proposed requirement that the assembly be "approved" in addition to "listed" allows the Code Official to specifically approve the proposed application.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The use of the fire protective curtain assembly is an option and as such, atria enclosures can continue to be constructed as currently permitted.

Analysis: A review of the standard proposed for inclusion in the code, UL 10D-14, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2015

G35-18

IBC: 404.10.1 (New)

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Add new text as follows:

404.10.1 Exit stairs in an atrium. Where an atrium contains an interior exit stairway all the following shall be met:

1. The exit stair shall have access from a minimum of two directions.
2. The distance between an exit stair in an atrium, and a minimum of one exit stair enclosed in accordance with Section 1023.2 shall comply with Section 1007.1.1.
3. Exit access travel distance within the atrium shall be measured to the nosing of the landing at the top of the stair on each level served.
4. At least one exit shall not be located in the same atrium.

Reason:

An exit stair is currently permitted to be in an atrium enclosure by IBC Sections 2023.1 and 1023.2, which allows enclosure per Section 404.6. These new provisions for the conditions for use of an atrium for an exit stair adds four specific criteria for their use as an exit.

Provision 1 - Accessed from two directions

This means that the exit stair in the atrium must have two paths of travel to allow the occupants to pass by the stair.

Provision 2 - Separation distance

To make it clear that the exit stair in the atrium must be separated from at least one other exit stair meeting IBC Section 1023.2 by the minimum separation distance prescribed in Section 1007.1.1.

Provision 3 - Travel distance

The travel distance within the atrium to the exit stair in the atrium is to be measured to the nosing at the level the stair is serving.

Provision 4 - At least one exit is not in the atrium.

Requires that at least one exit is not permitted to be in the same atrium. The current provisions of Section 404.10 prohibit more than 50% of exit stairs from egressing through the atrium at the level of exit discharge.

Cost Impact

The code change proposal will decrease the cost of construction .

This change will facilitate design decisions, reduce the number of required exit enclosures in buildings with an atrium and help with review and approval, reducing the cost of construction.

Internal ID: 1694

G36-18

IBC: 406.2.4

Proponent: Stephen Skalko, representing Stephen V. Skalko, P.E. & Associates, LLC (svskalko@svskalko-pe.com); Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Jason Krohn, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org)

2018 International Building Code

406.2.4 Floor surfaces. Floor surfaces shall be of concrete or similar approved noncombustible and nonabsorbent materials. The area of floor used for the parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. The surface of vehicle fueling pads in motor fuel-dispensing facilities shall be in accordance with Section 406.7.1.

Exceptions:

1. Asphalt parking surfaces shall be permitted at ground level for public parking garages and private carports.
- ~~2. Floors of Group S-2 parking garages shall not be required to have a sloped surface.~~
- 3.2. Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm², as determined by ASTM E648 or NFPA 253, shall be permitted in repair garages.

Reason:

The charging language in Section 406.1 specifies that all motor-vehicle-related occupancies, which includes open parking garages in accordance with 406.5 and enclosed parking garages in accordance with 406.6. Further, Section 406.2.4 requires floors in motor-vehicle-related occupancies to be of concrete or similar noncombustible and nonabsorbent materials, and be provided with a slope. However, Exception No. 2 to Section 406.2.4 creates confusion for the user because it exempts Group S-2 parking garages from the sloped floor provision. Per Section 311.3 open and enclosed parking garages are an S-2 occupancy group. By exempting Group S-2 parking garages from the sloped floor provisions Exception No. 2 renders the second sentence in the subsection meaningless. In addition, exempting parking garages from the sloped floor provisions is detrimental to the structure.

Exception No. 2 was introduced into the code with code change G78-06/07. The reason given was “Many larger parking structures are constructed with prefabricated materials that are difficult if not impossible to design to slope all surfaces”. This reason statement made no reference to studies or other technical information to indicate providing sloped floors in large parking structures of prefabricated materials is problematic. In fact, in the precast concrete industry, which represents the largest segment of the prefabricated materials industry used for parking garages, sloped floors are an essential part of the design of these types of structures to insure proper durability.

In Section 3.2 of Precast Prestressed Concrete Parking Structures: Recommended Practice for Design & Construction [1] poor drainage is listed as one of the major factors detrimental to a durable parking structure. Frequently vehicles can transport deleterious materials such as oils and deicing salts into the parking structures from the streets. Sloped floors provide a means to allow these materials to be removed from the deck surface by the vertical drainage systems. This reduces the likelihood that these deleterious materials will cause damage to the concrete wearing surface and the reinforcement within. Section 3.4.2 of the Recommended Practice is devoted to providing design guidance and construction techniques with sloped floors to achieve proper drainage in support of this durable design goal.

Section 6.2 of ACI 362.1R, Guide for the Design and Construction of Durable Concrete Parking Structures [2] also recommends that sloped floors be provided for parking structures to improve durability. This Guide suggests this is especially important since ponding water can result in increased deposits of chlorides in the concrete, which can be detrimental to the long term structural integrity of the structure.

Exception No. 2 should be deleted from Section 406.2.4 to eliminate the confusion in this section and preserve the durability of parking structures.

Bibliography:

[1] Precast Prestressed Concrete Parking Structures: Recommended Practice for Design & Construction, 3rd edition, 2015, Precast Prestressed Concrete Institute, Publication MNL-129-15, www.pci.org last visited December 2015

[2] ACI 362.1R-12 Guide for the Design and Construction of Durable Concrete Parking Structures, 2012 American Concrete Institute, Farmington Hills, MI 48331

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Deletion of the exception will not have an adverse impact on cost because common design and construction practice for parking garages already includes sloped floors in the design for durability.

Internal ID: 1540

G37-18

IBC: TABLE 406.5.4

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Stephen V. Skalko, P.E. & Associates, LLC (svskalko@svskalko-pe.com); Jason Krohn, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

2018 International Building Code

Revise as follows:

**TABLE 406.5.4
OPEN PARKING GARAGES AREA AND HEIGHT**

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	HEIGHT (in tiers)		
		Ramp access	Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	12 tiers	12 tiers	18 tiers
IIA	50,000 <u>75,000</u>	10 tiers	10 tiers	15 tiers
IIB	50,000	8 tiers	8 tiers	12 tiers
IV	50,000	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m².

Reason:

When the International Building Code (IBC) the drafting committees were developing the IBC, they commonly used the least stringent fire safety provisions from one of the legacy codes (i.e. BOCA National Building Code, Standard Building Code, Uniform Building Code) in establishing the requirements. However, for open parking garages the least stringent values in the Standard Building Code (SBC) were not used. The SBC permitted open parking structures of non-combustible construction with less fire resistance (i.e. SBC Type IV construction, IBC Type II construction) to be built up to 400,000 sqft in area per tier. This area value, which was placed in the SBC in the early 1980's, was based on the use of noncombustible materials for construction of the open parking structure, the open sided features for the parking structure which reduced the risk of adverse impact from vehicle fires and the documented low fire risk vehicles pose to the stability of open parking structures[1],[2].

Additional studies of fire experience in open parking structures in the United States since those earlier ones still supports the conclusion that vehicle fires pose a low risk of fire damage to the parking structure. The more recent analysis of parking garage structure fires (i.e. NFPA[3], Parking Market Research Company [4]) by the Fire Safety Committee of the Parking Consultants Council concluded that in about 98.7% of the fires no structural damage occurred due to the parking structure fires studied[5]. This suggests that the present values in Table 406.5.4 for Open Parking Garages of IBC Type II construction are more stringent than necessary based on the low risk of fire damage to the structural elements from vehicle fires and should be permitted to increase.

During the 2015 Group A cycle for code changes to the 2012 IBC, a similar code change was submitted by PCI for consideration (G101-15). The IBC General Code Committee recommended disapproval of the proposal at the code development hearing, suggesting there was merit to allow bigger open parking garages when constructed using buildings of fire resistive construction, however the table values proposed in G101-15 were considered too large. Based on that feedback PCI has modified the original proposal to reduce the area per tier permitted for Type IIA construction as reflected in this code change.

The area per tier proposed is based on a common open parking garage design utilizing a footprint of 240-feet X 315-feet (4 bays @ 60-ft/bay X 35 parking spaces @ 9-ft each), which totals 75,600 sf. The table value was rounded to 75,000 sf. This area per tier, based on 10 tiers, results in an aggregate parking area consistent with the aggregate allowable floor area for an enclosed sprinklered S-2 parking garage, per Tables 504.4 and 506.2.

Based on the low risk of vehicle fires and resulting damage, and the open sided features of these garages, this proposal will permit open parking garages of Type IIA construction to be built to areas like those permitted for sprinklered enclosed parking garages.

Bibliography:

[1] Harris, Dr. Leslie, Market Research Associates, Survey of Fire Experience in Automobile Parking Structures in the United States and Canada, January 31, 1972.

[2] Harris, Dr. Leslie, Market Research Associates, 1979 Update of the Survey of Fire Experience in Automobile Parking Structures in the United States and Canada, January 31, 1979.

[3] Ahrens, Marty, National Fire Protection Association, Structure and Vehicle Fires in General Vehicle Parking Garages, January 2006

[4] Dendra, Dale F., Parking Market Research Company, McLean, VA, Parking Garage Fires (A Statistical Analysis of Parking Garage Fires in the United States 1986-1988), April 1992

[5] Parking Consultants Council Fire Safety Committee, Parking Structure Fire Facts, December 2008

Cost Impact

The code change proposal will decrease the cost of construction .

Permitting larger open parking garages of Type IIA construction will result in a reduction in cost without any compromise in fire safety through savings in material and construction methods required for open parking structures that would otherwise have to meet Type IB construction.

Internal ID: 1544

G38-18

IBC: 406.5.7, 1006.3.3 (IFC[BE] 1006.3.3)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows:

406.5.7 Means of egress. ~~Where persons other than parking attendants are permitted, open~~ Open parking garages shall meet the *means of egress* requirements of Chapter 10. ~~Where persons other than parking attendants are not permitted, there shall be not fewer than two exit stairways. Each exit stairway shall be not less than 36 inches (914 mm) in width.~~ Lifts shall be permitted to be installed for use of employees only, provided that they are completely enclosed by noncombustible materials.

1006.3.3 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or occupied roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and common path of egress travel distance do not exceed the values in Table 1006.3.3(1) or 1006.3.3(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.~~
- ~~3.4.~~ Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.
- ~~4.5.~~ 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:
 - ~~4.1.5.1.~~ The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.
 - ~~4.2.5.2.~~ 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*.

Reason:

The purpose of this change is to address limitations in requirements for means of egress components for parking garages. Section 406.5.7 where the requirements are different for attendants than for the general public in open parking garages. And Section 1006.3.3 which allows for a single exit or exit access for parking garages with mechanical parking.

Section 406.5.7 assumes there is a lower life hazard for attendant parking than when individuals park their own vehicles. Not only are the number of exits potentially reduced depending upon the size of the parking structure, the width is allowed to be 36 inches rather than the required 44 inches.

There is no justification to assume attendant valet parking presents a lower egress need than public parking. Just as public parking can have ebbs and flows so can valet parking. Every parking garage has times when there is peak usage, in the case of valet parking the number of attendants is increased based upon when the highest in and out flows are expected. Hotels for example might have a morning rush to leave and then an afternoon rush for arrivals.

The ebbs and flows are also different for where the parking garage is, a factor the code ignores. Some facilities may have attendant parking when they open, but down the line eliminate it for self parking. A factor not considered.

The main factor not considered is where the fire may be. Open parking garages do not have automatic fire suppression, the fires generate considerable heat, smoke, toxics, all of which can move anywhere on the fire floor based upon atmospheric conditions potentially blocking the path to the limited egress paths.

The reduction in the stairway widths also ignores the fact that the fire service will use the same stairways to gain access to the fire floor hauling equipment with them.

A good example of how the reduction in protection is convoluted is that in many cases the portion for valet parking is

open to the portion for public access separated only by barriers easily overcome by occupants if they actually have physical barriers. A fire on the level shared can impact both areas and/or can force the public to climb over a potential low barrier to escape through the valet area.

Section 406.5.7 is proposed to be modified to simply point to Chapter 10 for egress requirements and leave the allowance for employee lifts.

Section 1006.3.3 Exception 3 allows parking garages utilizing mechanical parking to have a single exit. There are no qualifications on size of the space or suppression requirements. There is no technical justification for allowing a single exit condition where the exit could be blocked by a fire event. The Commentary includes:

"Item 3 allows for one exit from all stories in a parking garage where the cars are mechanically parked. This is in recognition of the extremely low occupant load in this unique type of building. The single exit would be for maintenance and service personnel who could be on the different levels...."

So because employees are not part of the public their lives are worth less? What about the single fire event taking out the single stairway at a lower level? From a practical or a fire protection standpoint this has no justification.

This exception also ignores the fact that the stairways do double duty, egress and the fire service use the stairways to access the fire floor.

Since there is no justification for the single exit allowance from a life safety perspective or from a firefighting access viewpoint Exception 3 for Section 1006.3.3 is recommended for deletion.

An additional important factor to consider is that the materials in vehicles has changed to add more combustible synthetic material, thinner/lighter metals and a growing increase of alternative fueled vehicles, GH2, CNG, LPG and Lithium-Ion batteries. Electric Vehicle charging stations have been installed within parking garages to encourage their use.

Basically, the current requirements for parking garages, open or closed, in the codes are based on old vehicle concepts and studies.

Multi-vehicle large fires can occur and have occurred. As in any multi-story building, effective firefighting actions to protect life and property involved being able to quickly apply water to the fire. The type of fire and danger presented by that fire has increased as the use of alternative fueled vehicles has increased. Access is important to suppressing the fire with hose lines.

It's time the requirements for parking garages were improved recognizing the increased fire hazards and fuel loads presented by alternative fueled vehicles and vehicles with more plastic components.

Background material.

<http://www.urbanfiretraining.com/parking-garages>.

<http://www.firerescuemagazine.com/articles/print/volume-7/issue-2/strategy-andtactics/fighting-vehicle-fires-in-parking-garages.html>

<http://www.fireengineering.com/ap-news/2018/01/01/parking-garage-fire-destroys-hundreds-of-cars-in-uk.html>

<https://www.youtube.com/watch?v=KVx6avRTNCA>

<https://www.youtube.com/watch?v=HK0U-PKJ1NE>

Cost Impact

The code change proposal will increase the cost of construction .

This code change will increase the cost of construction for open parking garages and parking garages with mechanical parking by requiring additional enclosed exit stairs.. But the increased is over weighed by the negative safety impact potential to occupants of the increase of fuel loads in today's parking garages.

Internal ID: 2304

G39-18

IBC: 202(New), 406.6.4(New), 406.6.4.1(New), 406.6.4.2(New), 406.6.4.3(New), 406.6.4.4(New), 406.6.4.5(New), TABLE 508.4; 903.2.10.2(New), TABLE 902.3.11.6 (IFC 202(New), 903.2.10.2(New), TABLE 902.3.11.6)

Proponent: James Carver, El Segundo Fire Department, representing El Segundo Fire Department (JCarver@elsegundo.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

202 MECHANICAL-ACCESS ENCLOSED PARKING GARAGE An enclosed parking garage other than single car stacking systems which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay.

Add new text as follows:

406.6.4 Mechanical-access garages. Mechanical-access enclosed parking garages shall be in accordance with Sections 406.6.4.1 through 406.6.4.5.

406.6.4.1 Separation. Mechanical-access enclosed parking garages shall be separated from other occupancies and accessory uses by not less than 2-hour fire barriers constructed in accordance with Section 707 or by not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

406.6.4.2 Smoke removal. A mechanical smoke removal system, in accordance with Section 910.4, shall be provided for all areas containing an enclosed mechanical-access parking garage.

406.6.4.3 Fire control equipment. The fire control equipment, consisting of the fire alarm control unit, mechanical ventilation controls and emergency shut down shall be provided in a room with exterior access. The room size and location shall be approved by the fire code official.

406.6.4.4 Firefighter access. Access doors shall be provided at the ground level for firefighter access as approved by the fire code official.

406.6.4.5 Emergency shutdown switch. A manually activated emergency shutdown switch shall be provided for use by emergency personnel.

Revise as follows:

**TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)^f**

OCCUPANCY	A, E		I-1 ^a , I-3, I-4		I-2		R ^a		F-2, S-2 ^b , U		B ^e , F-1, M, S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3	2	NP
I-1 ^a , I-3, I-4	-	-	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	-	-	-	-	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R ^a	-	-	-	-	-	-	N	N	1 ^c	2 ^c	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2 ^b , U	-	-	-	-	-	-	-	-	N	N	1	2	NP	NP	3	4	2	3	2	NP
B ^e , F-1, M, S-1	-	-	-	-	-	-	-	-	-	-	N	N	NP	NP	2	3	1	2	1	NP
H-1	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	NP	NP	NP	NP	NP	NP
H-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	1	NP	1	NP
H-3, H-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 ^d	NP	1	NP
H-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not Permitted.

- a. See Section 420.
- b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.
- c. See Section ~~406.3.2~~ 406.3.2 and 406.6.4.
- d. Separation is not required between occupancies of the same classification.
- e. See Section 422.2 for ambulatory care facilities.
- f. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring fire protection systems shall also comply with Section 707.3.10 and Table 707.3.10 in accordance with Section 901.7.

2018 International Fire Code

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows:

202 MECHANICAL-ACCESS ENCLOSED PARKING GARAGE An enclosed parking garage, other than single car stacking system, which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay.

Add new text as follows:

903.2.10.2 Mechanical-access enclosed parking garages. An approved automatic sprinkler system shall be provided throughout buildings used for the storage of motor vehicles in a mechanical-access enclosed parking garage. The portion of the building that contains the mechanical-access enclosed parking garage shall be protected with a performance-based design specially engineered sprinkler system.

Revise as follows:

**TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS**

SECTION	SUBJECT
<u>903.2.10.2</u>	<u>Mechanical-access enclosed parking garages</u>
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1029.6.2.3	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
1103.5.4	Existing Group I-2, Condition 2 occupancies
1103.5.4	Pyroxylin plastics
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.2.6.2	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
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 m³.

Reason:

Enclosed mechanical-access parking garages are being constructed in the United States on an increasing basis, yet there is no prescriptive code requirements for these occupancies. These occupancies are unique from the traditional open mechanical-access parking garage in that there are no openings, the entire structure is enclosed. These occupancies are more similar to automated high rack storage systems, they have no floors, no stairwells and no above ground level access, except maintenance walkways and ladders. With these being a silent occupancy type, the Code does not provide the code official with prescriptive requirements. There are fires involving parked vehicles with the vehicle parked and the ignition system off. If a fire were to occur in an enclosed mechanical-access parking garage, unless the local code authority required additional fire protection during construction, they do not have a point-setter to code requirements. Where these systems have been installed, there is not a consistent fire protection methodology to protecting these structures from a fire.

An enclosed mechanical-access parking garage offers many firefighting challenges; most are constructed in a building shell, without a floor system. The vehicles are parked in a cage/rack system, with no safe elevated access to the interior of the structure. With firefighter safety in mind and to have the ability to use fixed fire suppression to extinguish and/or control these fires, the code proposal is presented.

IFC Section 202 adds a definition for these occupancies. Open mechanical-access parking garages are defined in the Code, but do not pose the firefighting challenge as an enclosed mechanical access parking garage. An open parking garage has floors, stairwells, standpipe connections and natural ventilation. An enclosed garage is in a box, no stairwells or floors or standpipes for elevated firefighting, and no ventilation to remove the products of combustion, heat and super-heated gases.

IBC Section 406 6.1.3 is added to require a minimum 2-hour fire separation between these occupancies and other uses. If a fire were to occur in the occupancy, partitioning is needed to protect adjoining occupancies and other uses until the fire can be contained by the sprinkler system and mechanical ventilation.

IFC Section 320 is added to provide basic prescriptive requirements to provide for firefighter safety and to assist in the extinguishment of these fires, providing ground level access doors for firefighting operations, a room to consolidate the required fire control equipment, mechanical smoke removal and an emergency shut down switch. These occupancies are similar to high-piled automated storage systems. The general requirements are similar to high piled rack and automated storage requirements in Chapter 32.

IFC Section 903.2.10.2 is added to prescriptively require a performance-based designed sprinkler system. With the projected fire load in these occupancies and the inability to get water to the seat of the fire, a prescriptively designed sprinkler system is not anticipated to provide the required water for fire suppression.

Footnote c in IBC Table 508.4 is added to include the new section, 406.6.1.3.

Section 320 is being added to IFC Table 903.2.11.6 to the list of occupancies requiring additional fire suppression systems.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal is to provide prescriptive language for enclosed mechanical-access parking garages. These code requirements are being currently enforced as part of a performance-based design when approved and constructed. As the designed and builder will have prescriptive requirements, they will not be required to obtain an Alternative Materials and Methods approval for each project.

Internal ID: 1452

G40-18

IBC: 407.2.6, 407.2.7 (New); IFC: 904.13 (IBC[F] 904.13)

Proponent: John Williams, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

407.2.5 Nursing home housing units. In Group I-2, Condition 1 occupancies, in areas where nursing home residents are housed, shared living spaces, group meeting or multipurpose therapeutic spaces shall be permitted to be open to the *corridor*, where all of the following criteria are met:

1. The walls and ceilings of the space are constructed as required for *corridors*.
2. The spaces are not occupied as resident sleeping rooms, treatment rooms, incidental uses in accordance with Section 509, or hazardous uses.
3. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
4. The *corridors* onto which the spaces open, in the same *smoke compartment*, are protected by an automatic fire detection system installed in accordance with Section 907, or the *smoke compartment* in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
5. The space is arranged so as not to obstruct access to the required *exits*.

Revise as follows:

407.2.6 Nursing home cooking facilities. In Group I-2, Condition 1 occupancies, rooms or spaces that contain a cooking facility with domestic cooking appliances shall be permitted to be open to the corridor where all of the following criteria are met:

1. The number of care recipients housed in the smoke compartment shall not be greater than 30.
2. The number of care recipients served by the cooking facility shall not be greater than 30.
3. Not more than one cooking facility area shall be permitted in a smoke compartment.
- ~~4. The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.~~
- ~~5.4.~~ The corridor shall be a clearly identified space delineated by construction or floor pattern, material or color.
- ~~6.5.~~ The space containing the domestic cooking facility shall be arranged so as not to obstruct access to the required exit.
- ~~7.6.~~ Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Codes shall be provided over cooktops and ranges. The cooking appliance shall comply with Section 407.2.7.
- ~~8. Cooktops and ranges shall be protected in accordance with Section 904.13.~~
- ~~9. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff.~~
- ~~10. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.~~
- ~~11. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30 foot (9144 mm) distance of travel from each domestic cooking appliance.~~

Add new text as follows:

407.2.7 Domestic cooking appliances. In Group I-2 occupancies, installation of cooking appliances used in domestic cooking facilities shall comply with all of the following:

1. The types of cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.
2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the

International Mechanical Code shall be provided over cooktops and ranges.

3. Cooktops and ranges shall be protected in accordance with Section 904.13.
4. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff.
5. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
6. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.

2018 International Fire Code

Revise as follows:

904.13 Domestic cooking systems, facilities. Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.13.1:

1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section 420.8 of the International Building Code.
2. In Group I-2, ~~Condition 1~~ occupancies where domestic cooking facilities are installed in accordance with Section ~~407.2.6~~ 407.2.7 of the International Building Code.
3. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.10 of the International Building Code.

Reason:

The intent of this proposal is for no technical change, but is to separate the requirements for domestic cooking appliances and exhaust from the allowance for that area to be open to the corridor in a nursing home. If someone wants to do a domestic cooking area in a room in a nursing home or hospital, such as for therapy or nutrition training purposes, they would still have to follow all the domestic cooking regulations for the equipment. This is also coordinated with the language for Group I-1 requirements in Section 420. This is not intended to change any of the provisions for the commercial cooking areas. The change in IFC is correlation only.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is an editorial separation with no technical changes for cooking facilities open to the corridor. This is a clarification of a domestic cooking appliance if it is within a room in a Group I-2 - currently some code officials would ask for commercial hoods, others would ask for domestic hoods.

Internal ID: 1291

G41-18

IBC: 407.2.6

Proponent: John Williams, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows:

407.2.6 Nursing home cooking facilities. In Group I-2, Condition 1 occupancies, rooms or spaces that contain a cooking facility with domestic cooking appliances shall be permitted to be open to the corridor where all of the following criteria are met:

1. The number of care recipients housed in the smoke compartment shall not be greater than 30.
2. The number of care recipients served by the cooking facility shall not be greater than 30.
3. Not more than one cooking facility area shall be permitted in a smoke compartment.
4. The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.
5. The corridor shall be a clearly identified space delineated by construction or floor pattern, material or color.
6. The space containing the domestic cooking facility shall be arranged so as not to obstruct access to the required exit.
7. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops and ranges.
8. Cooktops and ranges shall be protected in accordance with Section 904.13.
9. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff.
10. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
11. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.

Exceptions:

1. Cooktops and ranges located within smoke compartments with no patient sleeping or patient care areas are not required to comply with this section.
2. Cooktops and ranges used for care recipient training or nutritional counseling are not required to comply with Item 8 of this section.

Reason:

If the proposal to split this section is also accepted, the exceptions would be applicable to the new section dealing with the cooktops and ranges.

This section was originally added to the code to allow nursing homes to have a more home like atmosphere, including small dining rooms and kitchen areas available to serve and possibly used by residents. The intent of this proposal is to allow for some exceptions for other domestic cooking.

Exception 1: The idea of this proposal for kitchens that outside of patient sleeping areas, such as a break room in the business area of a hospital, to not have to provide the protection features required to kitchens shared by care recipients. Hospitals are required to be sprinklered and separated. In these limited situations additional protection, shut offs, timers and additional portable fire extinguishers are not justified.

Exception 2: Exception 2 - The idea of this proposal for kitchens in therapy areas or for nutrition counseling is to not have to provide the UL300A hood protection features required to kitchens shared by care recipients.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference

calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Cooktops and ranges used for domestic purposes would still have to comply with the IMC for ventilation. This is a clarification for where additional protection, shut offs, timers and additional portable fire extinguishers are not needed.

Internal ID: 1295

G42-18

IBC: 407.3.1.1 (New), 710.5.2.1

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

407.3 Corridor wall construction. Corridor walls shall be constructed as smoke partitions in accordance with Section 710.

407.3.1 Corridor doors. Corridor doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an exit, shall not have a required *fire protection rating* and shall not be required to be equipped with *self-closing* or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.

Add new text as follows:

407.3.1.1 Door construction. Doors in corridors not required to have a fire protection rating shall comply with the following:

1. Solid doors shall have close fitting operational tolerances, head and jamb stops.
2. Dutch style doors shall have an astragal, rabbet or bevel at the meeting edges of the upper and lower door sections. Both the upper and lower door sections shall have latching hardware. Dutch style door shall have hardware that connects the upper and lower sections to function as a single leaf.
3. To provide make-up air for exhaust systems in accordance with Section 1020.5, Exception1, doors are permitted to have louvers or to have a clearance between the bottom of the door and the floor surface that is 2/3 inches (19.1 mm) maximum.

710.5 Openings. Openings in smoke partitions shall comply with Sections 710.5.1 and 710.5.2.

710.5.1 Windows. Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke.

710.5.2 Doors. Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.

Revise as follows:

710.5.2.1 Louvers. Doors in smoke partitions shall not include louvers.

Exception: Where permitted in accordance with Section 407.3.1.1.

Reason:

There are various type of doors used in corridors of care facilities. The additional language provides clarity and guidance on how these various types of doors are configured. These minimum configuration requirements are basics that have existed in other sections of the code, particularly at section 709.5, Exception 1. Therefore, they have existed in care facilities for some time, and are being specifically quantified in Chapter 4 to align with the CMS federal standard (K362).

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This adds requirement to explain what is required for a door to limit the transfer of smoke. However, it does not add cost to the healthcare industry because we already follow these requirements in the context of the CMS federal standard.

Internal ID: 602

G43-18

IBC: 407.4.4.1, 407.4.4.3

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows:

407.4.4 Group I-2 care suites. *Care suites* in Group I-2 shall comply with Sections 407.4.4.1 through 407.4.4.4 and either Section 407.4.4.5 or 407.4.4.6.

407.4.4.1 Exit access through care suites. *Exit* access from all other portions of a building not classified as a *care suite* shall not pass through a *care suite*. ~~In a *care suite* required to have more than one exit, one exit access is permitted to pass through an adjacent *care suite* provided that all of the other requirements of Sections 407.4 and 1016.2 are satisfied.~~

407.4.4.2 Separation. *Care suites* shall be separated from other portions of the building, including other care suites, by a smoke partition complying with Section 710.

407.4.4.3 Access to corridor. Every suite shall have a door leading directly to an exit access corridor or horizontal exit. Movement from habitable rooms within the suite shall not require passage through more than three doors and 100 feet (30 480 mm) distance of travel within the travel within the suite to a door leading to the exit access corridor or horizontal exit. Where a caresuite is required to have more than one exit access door by Section 407.4.4.5.2 or 407.4.4.6.2, the additional door shall lead directly to an exit access corridor, horizontal exit or an adjacent suite.

Exception-Exceptions:

1. The distance of travel shall be permitted to be increased to 125 feet (38 100 mm) where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.
2. Where two or more exit access doors are required by Section 407.4.4.5.2 or 407.4.4.6.2, not more than one of the doors shall be permitted to be exit door to an exit stairway, exit ramp, exit passageway, or an exterior exit door.

Reason:

Since this section was heavily edited in the 2012 version of the code, the federal rules have changed. This change reflects those changes and provides additional clarity relating to the exit access options out of a suite. The federal regulations stopped counting number of intervening rooms, instead relying on overall travel (K256 and K257).

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal allows for one door out of a suite to be an exit door. This allows for additional design flexibility without adding any additional requirements.

Internal ID: 599

G44-18

IBC: 407.4.4.3

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows:

407.4.4.3 Access to corridor. Movement from habitable rooms shall not require passage through more than three doors and 100 feet (30 480 mm) distance of travel within the suite.

~~**Exception:** The distance of travel shall be permitted to be increased to 125 feet (38 100 mm) where an automatic smoke detection system is provided throughout the care suite and installed in accordance with NFPA 72.~~

Reason:

Since this section was heavily edited in the 2012 version of the code, the federal rules have changed. Current federal requirements do not allow increase to 125ft travel distance (K225).

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will increase the cost of construction .

Limitations on travel distance will limit flexibility and potentially increase construction cost.

Internal ID: 598

G45-18

IBC: 202 (New), 407.4.5 (New), 407.4.5.1 (New), 407.4.5.2 (New), 407.4.5.3 (New), 407.4.1

Proponent: John Mengedoht, representing NBBJ (jmengedoht@nbbj.com)

THIS CODE CHANGE WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

NON-PATIENT-CARE SUITE. In Group I-2 occupancies, a group of rooms or spaces not intended for patient sleeping, patient care or treatment, where the suite is in compliance with the requirements of Section 407.4.5.

Add new text as follows:

407.4.5 Group I-2 non-patient-care suites. Non-patient-care suites in Group I-2 shall comply with Sections 407.4.5.1 through 407.4.5.3.

407.4.5.1 Exit access through non-patient-care suites. Exit access from all other portions of a building not classified as a non-patient-care suite shall not pass through a non-patient-care suite. In a non-patient-care suite required to have more than one exit, one exit access is permitted to pass through an adjacent care suite or non-patient-care suite provided that all of the other requirements of Section 407.4 and 1016.2 are satisfied.

407.4.5.2 Separation. Non-patient-care suites shall be separated from other portions of the building by a smoke partition complying with Section 710.

407.4.5.3 Area. Non-patient-care suites shall have an area not greater than 22,500 square feet (2092 m²).

Revise as follows:

407.4.1 Direct access to a corridor. Habitable rooms in Group I-2 occupancies shall have an *exit access* door leading directly to a *corridor*.

Exceptions:

1. Rooms with *exit* doors opening directly to the outside at ground level.
2. Rooms arranged as *care suites* complying with Section 407.4.4.
3. Rooms arranged as non-patient-care suites complying with Section 407.4.5.

Reason:

The 2012 IBC added the requirement in Section 407.4.1 for Group I-2 occupancies to provide direct access (no intervening spaces) to a corridor from "habitable" rooms. Exceptions are provided for rooms with direct exits to the exterior and for rooms arranged as "care suites." Both the direct corridor access requirement and the concept of care suites are very similar to the requirements for hospitals in the 2012 NFPA 101, which hospitals also must comply with in order to receive Medicare or Medicaid funds.

The term "habitable rooms" is not defined in Section 202 but the Code Commentary indicates that it includes not only patient sleeping rooms but also patient treatment rooms as well as staff areas such as staff lounges and staff work areas. The exception to direct corridor access for care suites allows necessary flexibility in the arrangement of patient rooms and other patient care areas. However, by definition, a care suite excludes staff lounges or staff work areas that are not directly related to supervision of care recipients within a suite. This frequently results in inefficient layouts for staff areas. In addition, since the term "habitable rooms" is interpreted very broadly by code officials, the configuration of small waiting areas is also often impacted.

The NFPA 101 provides flexibility through the use of "non-patient-care" suites which, for whatever reason, were not included in the 2012 IBC or subsequent editions. This proposal is intended to bring the IBC into closer alignment with the NFPA 101 in this regard and to provide for more efficient layouts of staff areas with no negative impact on patient safety.

Since most hospitals are of Type I construction, it would theoretically be possible to classify staff areas and other areas as Group B rather than Group I-2 as a way to allow intervening spaces and more efficient layouts. By using the nonseparated occupancies provisions of IBC 508.3, no separations would be required between such areas and adjacent hospital spaces. However, the NFPA 101, which also applies to hospitals, requires a 2 hour separation between other occupancies per Section 18.1.3.2. Thus, hospital designers are often faced with the choice between inefficient layouts and the needless expense of a 2 hour fire barrier.

Cost Impact

The code change proposal will decrease the cost of construction .

By incorporating non-patient-care suites into the design of hospitals, construction cost will be decreased through more efficient layouts with less space dedicated to corridors. Alternatively, construction cost will be reduced by eliminating the need to classify staff areas as Group B with a 2 hour occupancy separation.

Internal ID: 2149

G46-18

IBC: 407.6.1 (New)

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

407.6 Automatic-closing doors. Automatic-closing doors with hold-open devices shall comply with Sections 709.5 and 716.2.

Add new text as follows:

407.6.1 Activation of automatic-closing doors. Automatic-closing doors on hold-open devices in accordance with Section 716.2.6.6 shall also close upon activation of a fire alarm system, an automatic sprinkler system, or both. The automatic release of the hold open device on one door shall release all such doors within the same smoke compartment.

Reason:

This addition of this language is required in order to conform with Federal Standards and Centers for Medicaid and Medicare Services enforcement rules (K233). Doors that are required to be automatic-closing and on hold-open devices, were not clearly defined that they need to close upon all of these events, nor was it clear that all doors would need to close upon actuation of one door. This provides a higher level of life-safety for the residents and care recipients.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls

Cost Impact

The code change proposal will increase the cost of construction .

This may increase construction cost to interlock these doors with the fire alarm and sprinkler activation. This was already required to connect to the smoke detection system per Section 716.2.6.6. However, it does not add cost to the healthcare industry because certified facilities already follow these requirements in the context of the federal standards.

Internal ID: 590

G47-18

IBC: 408.9

Proponent: Raymond Grill, Arup, representing Self (ray.grill@arup.com)

2018 International Building Code

Revise as follows:

408.9 Windowless buildings. For the purposes of this section, a windowless building or portion of a building is one with nonopenable windows, windows not readily breakable or without windows. Windowless buildings shall be provided with an engineered smoke control system to provide a tenable environment for exiting from the *smoke compartment* in ~~the area of fire origin in~~ accordance with Section 909 for each windowless *smoke compartment*.

Reason:

Providing a tenable environment within the area of fire origin can be impractical to impossible depending on the fire. Take an example of a fire within a cell. If an inmate were to utilize an accelerant to ignite combustibles within the cell, it would be immediately untenable. Detention centers are required to have at least two smoke compartments on stories providing inmate housing. The number of occupants in a smoke compartment and the travel distances within the compartment are limited to facilitate evacuation. Detention centers typically provide smoke control utilizing the pressure differential method to contain smoke to the compartment of origin. The current code language is often interpreted to mandate the exhaust method which no matter what rate of exhaust is provided, it cannot provide a tenable environment in the location of the fire origin.

A smoke control system is not required if operable or breakable windows are provided. There is no criteria for size or percentage of opening. Operable windows also can't provide a tenable environment within the area of origin. Provision of a smoke control system should not require a higher standard of protection than operable windows.

Cost Impact

The code change proposal will decrease the cost of construction .

Providing very high exhaust air changes can significantly increase the cost of construction.

Internal ID: 2289

G48-18

IBC: 202, 411, 411.1, , 411.2, 411.3, 411.4, 411.5, 411.6, 411.6.1, 411.7, TABLE 1017.2;

IFC: 914.7, 914.7.1, 914.7.2, 3103.3.1;

ICCPC: A103.1.9.12

Proponent: Angie Wiese, representing self (angie.wiese@ci.stpaul.mn.us)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

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

Add new definition as follows:

PUZZLE ROOM A puzzle room is a type of special amusement area in which occupants are encouraged to solve a challenge to escape from a room or series of rooms.

Revise as follows:

SECTION 411 SPECIAL AMUSEMENT BUILDINGSAREAS

411.1 General. *Special amusement ~~buildings areas~~ having an occupant load of 50 or more shall comply with the requirements for the appropriate Group A occupancy and Sections 411.1 through ~~411.7-411.8.~~ Special amusement ~~buildings areas~~ having an occupant load of less than 50 shall comply with the requirements for a Group B occupancy and Sections 411.1 through ~~411.7-411.8.~~*

Exception: *Special amusement ~~buildings areas~~ or portions thereof that are without walls or a roof and constructed to prevent the accumulation of smoke need not comply with this section.*

~~For flammable decorative materials, see the International Fire Code.~~

Delete without substitution:

~~**[F] 411.2 Automatic fire detection.** *Special amusement buildings shall be equipped with an automatic fire detection system in accordance with Section 907.*~~

Revise as follows:

[F] 411.2 Automatic sprinkler system. Buildings containing special amusement areas shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement area is temporary, the sprinkler water supply shall be of an approved temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement area is less than 1,000 square feet (93 m²) and the exit access travel distance from any point in the special amusement area to an exit is less than 50 feet (15 240 mm).

Add new text as follows:

411.3 Fire alarm system. Buildings containing special amusement areas shall be equipped with an automatic smoke detection system in accordance with 907.2.12.

Delete without substitution:

~~[F] 411.4 Alarm.~~ Actuation of a single ~~smoke detector~~, the ~~automatic sprinkler system~~ or other automatic fire detection device shall immediately sound an alarm at the building at a ~~constantly attended location~~ from which emergency action can be initiated including the capability of manual initiation of requirements in Section 907.2.11.

Revise as follows:

~~[F] 411.5-411.4 Emergency voice/alarm communications system.~~ An emergency voice/alarm communications system shall be provided in accordance with Sections 907.2.11 and 907.5.2.2, is permitted to serve as a public address system and shall be audible throughout the entire ~~special amusement building~~.

Add new text as follows:

411.5 Puzzle room exiting. Puzzle room exiting shall comply with one of the following:

1. Exiting in accordance with Chapter 10.
2. An alternative design approved by the building official.
3. Exit shall be open and readily available upon activation by the automatic fire alarm system, automatic sprinkler system, and a manual control at a constantly attended location.

Revise as follows:

411.6 Exit marking. Exit signs shall be installed at the required ~~exit~~ or ~~exit access doorways of serving special amusement buildings areas~~ in accordance with this section and Section 1013. ~~Approved~~ directional exit markings shall be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, ~~approved~~ and listed low-level exit signs that comply with Section 1013.5, and directional path markings ~~listed~~ in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic ~~fire-smoke~~ detection system and the ~~automatic sprinkler system~~ in accordance with Section 907.2.11.

411.6.1 Photoluminescent exit signs. Where ~~photoluminescent exit~~ signs are installed, activating light source and viewing distance shall be in accordance with the listing and markings of the signs.

411.7 Interior finish. The ~~interior finish~~ in special amusement areas shall be Class A in accordance with Section 803.1.

**TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200 ^e	250 ^b
I-1	Not Permitted	250 ^b
B	200	300 ^c
F-2, S-2, U	300	400 ^c
H-1	Not Permitted	75 ^d
H-2	Not Permitted	100 ^d
H-3	Not Permitted	150 ^d
H-4	Not Permitted	175 ^d
H-5	Not Permitted	200 ^c
I-2, I-3	Not Permitted	200 ^c
I-4	150	200 ^c

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to *exit access* travel distance requirements:
 - Section 402.8: For the distance limitation in malls.
 - Section 404.9: For the distance limitation through an *atrium* space.
 - Section 407.4: For the distance limitation in Group I-2.
 - Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
 - Section ~~411.3~~411.2: For the distance limitation in special amusement ~~buildings~~ areas.
 - Section 412.6: For the distance limitations in aircraft manufacturing facilities.
 - Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
 - Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
 - Section 1006.3.3: For buildings with one exit.
 - Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
 - Section 1029.7: For increased limitation in assembly seating.
 - Section 3103.4: For temporary structures.
 - Section 3104.9: For pedestrian walkways.
- b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.
- c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
- d. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.1.
- e. Group R-3 and R-4 buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

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914.7 Special amusement ~~buildings~~ areas. Special amusement ~~buildings~~ areas shall comply with Sections 914.7.1 and 914.7.2.

914.7.1 Automatic sprinkler system. ~~Special Buildings containing special amusement buildings areas shall be~~ Special Buildings containing special amusement ~~buildings areas~~ areas shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the special amusement ~~building area~~ area is temporary, the sprinkler water supply shall be of an *approved* temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement ~~building area~~ area is less than 1,000 square feet (93 m²) and the *exit access* travel distance from any point in the special amusement area to an *exit* is less than 50 feet (15 240 mm).

914.7.2 Automatic smoke detection. Special amusement ~~buildings areas~~ areas shall be equipped with an automatic smoke detection system in accordance with Section 907.2.11.

3103.3.1 Special amusement ~~building area~~ area. Tents and other membrane structures erected as a special amusement ~~building area~~ area shall be equipped with an *automatic sprinkler system* in accordance with Section 411.3 of the International Building Code.

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[BG] A103.1.9.12 SP-12, Special amusement ~~building area~~ area. A temporary, permanent or mobile area, building or structure that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course, in any direction, so arranged that means of egress are not readily apparent because of visual or audible distractions, or are intentionally confounded, or are not readily available because of the nature of the attraction or the mode of conveyance through the building or structure. It shall be assumed that:

1. Occupants, visitors and employees are awake, alert, predominantly able to exit without the assistance of others and unfamiliar with the area, building or structure.
2. Risk of injury and risk to health assumed by occupants, visitors and employees during their use of the area, building or structure are predominantly involuntary and high.
3. Public expectations regarding the protection afforded those occupying, visiting or working in such a an area, building, ~~or structure or portion thereof~~ are high.

Reason:

Puzzle rooms are a new business model where people are placed in a room and asked either to find a way out of the room or to find their way to the next room in the puzzle. The rooms are typically small and might otherwise be classified as a B occupancy under the current code. Each of these are designed in a way to provide a unique experience for the customer. This unique design incorporates a number of possible features to disorient the occupants and/or disguise the exit route. Such a design is contrary to the foundations of code specified exiting provisions.

This proposal seeks to establish criteria for puzzle rooms by incorporating them into the special amusement section. Since part of the appeal of this business model is that each experience is different, there is no way to prescriptively handle every situation. The language is fairly generic but gives guidance on providing reliable exiting in an emergency.

While researching this proposal, it was recognized that the special amusement building section needed some updating. The word "building" is changed to "area" and the fire alarm provisions were rewritten to correlate with section 907 of the fire code.

Cost Impact

The code change proposal will increase the cost of construction .

Many of these rooms may be classified currently as a B occupancy as they are not specifically called out in the code. As such, there are very little requirements for fire alarm or sprinkler systems. Depending on the size and configuration of the room(s), this provision would increase the cost of construction.

Internal ID: 299

G49-18

IBC: [F]415.6, 415.6.1(New), 415.6.2(New), 415.6.3(New), 507.8.1.1.1, 507.8.1.1.2

Proponent: Tracie Dutter, Livermore-Pleasanton Fire Department, representing California Fire Chief's Association

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

[F] 415.6 Fire separation distance. Group H occupancies shall be located on property in accordance with the other provisions of this chapter. In Groups H-2 and H-3, not less than 25 percent of the perimeter wall of the occupancy shall be an *exterior wall*.

Exceptions:

1. ~~Liquid use, dispensing and mixing rooms having a floor area of not more than 500 square feet (46.5 m²) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30.~~
2. ~~Liquid storage rooms having a floor area of not more than 1,000 square feet (93 m²) need not be located on the outer perimeter where they are in accordance with the International Fire Code and NFPA 30.~~
3. ~~Spray paint booths that comply with the International Fire Code need not be located on the outer perimeter.~~

Add new text as follows:

415.6.1 Liquid use, dispensing and mixing rooms and rooms for flammable or combustible liquid use, dispensing or mixing in open systems. Liquid use, dispensing and mixing rooms and rooms for flammable or combustible liquid use, dispensing or mixing in open systems, where vapors are emitted, having a floor area of not more than 500 square feet (46.5 m²) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30.

415.6.2 Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems. Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems, where no vapors are emitted, having a floor area of not more than 1,000 square feet (93 m²) need not be located on the outer perimeter where they are in accordance with the International Fire Code and NFPA 30.

415.6.3 Spray paint booths. Spray paint booths that comply with the International Fire Code need not be located on the outer perimeter.

Revise as follows:

507.8.1.1.1 Liquid use, dispensing and mixing ~~rooms,~~ rooms and rooms for flammable or combustible liquid use dispensing or mixing in open systems. Liquid use, dispensing and mixing ~~rooms and~~ rooms for flammable or combustible liquid use, dispensing or mixing in open systems, where vapors are emitted, and having a floor area of not more than 500 square feet (46.5 m²) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30.

507.8.1.1.2 Liquid storage ~~rooms,~~ rooms and rooms for flammable or combustible liquid use in closed systems. Liquid storage ~~rooms and~~ rooms for flammable or combustible liquid use in closed systems, where no vapors are emitted, having a floor area of not more than 1,000 square feet (93 m²) need not be located on the outer perimeter where they are in accordance with the International Fire Code and NFPA 30.

Reason:

The code currently addresses liquid use, dispensing and mixing rooms with open containers and storage rooms with closed containers, but it is silent on rooms with closed systems. The intent of this code change proposal is to limit the size of rooms with flammable or combustible liquid use in closed systems, when the rooms do not have 25 percent of their perimeter on an exterior wall.

Liquid use, dispensing and mixing room is defined in Chapter 2 as a room in which Class I, II and IIIA flammable or combustible liquids are used, dispensed or mixed in open containers. Liquid storage room is defined in Chapter 2 as a room classified as a Group H-3 occupancy used for the storage of flammable or combustible liquids in a closed condition.

A closed system is defined in Chapter 2 as the use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel, system or piece of equipment.

Recent projects have highlighted the fact that this code section currently only places limits on the size of rooms not on an exterior wall if they have open use, dispensing or mixing and if they have closed containers in storage. However, it does not address flammable or combustible liquid use in rooms with closed systems. Some applicants do not want to have 25 percent of the perimeter of a large H-3 occupancy with a closed system on an exterior wall. According to an ICC technical opinion about an unlimited area building: As discussed earlier, the code is silent about the extent of use-closed (process) systems involving flammable liquids in an unlimited area building when 25% of exterior wall access along the perimeter is not available. Admittedly, in your case, some perimeter access was still available but less than 25%. In addition, the proposed overall area of the "interior" Group H occupancy (process system) was within the permitted 25% allowed for interior Group H occupancies. With that being said, we also discussed the relative hazard of the proposed process system and the lack of a specific direct correlation with the requirements for inside storage and dispensing rooms. As such, final evaluation of the proposed operation is subject to the code official.

The hazard of flammable or combustible liquids in closed use is between open use and closed storage. In general it is more similar to closed storage, although sometimes flammable or combustible liquids in closed systems are pressurized, which can increase the hazard. This code change proposal would limit the size of rooms with flammable or combustible liquids in closed use systems, in the same way it limits the size of liquid storage rooms. This is consistent with the International Fire Code Chapter 50, Table 5003.1.1(1) which limits the amounts of flammable and combustible liquids in closed systems the same way it limits the amounts of flammable and combustible liquids in storage.

Specifying the limitations for rooms with flammable or combustible liquids in closed use will allow for better customer service. It will eliminate uncertainty for the code official and provide better consistency for applicants.

As part of this code change proposal, the code language in IBC 415.6 was made the rule instead of the exception, as in IBC 507.8.1.1.2.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code is not clear in this area, so this code change proposal is to clarify the requirements to what it most closely resembles and what most jurisdictions enforce.

Internal ID: 1018

G50-18

IBC: 415.7 (New), 415.7.1 (New), 415.7.2 (New), 415.7.3 (New), 415.7.4 (New), 415.7.5 (New), 415.7.6 (New)

Proponent: Tracie Dutter, Livermore-Pleasanton Fire Department, representing California Fire Chief's Association

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Add new text as follows:

415.7 Fire department access doors. Fire department access doors shall be provided in Group H occupancies in accordance with Sections 415.7.1 through 415.7.6

415.7.1 General. Grade level Group H occupancies required to have not less than 25 percent of the perimeter of the occupancy on an exterior wall shall have at least one exterior door in an approved location for fire department access.

415.7.2 Access to doors. Fire department access doors shall be able to be accessed without the use of a ladder.

415.7.3 Labeled. Fire department access doors shall be labeled on the exterior side with a sign that reads: "FIRE DEPARTMENT ACCESS DOOR DO NOT BLOCK" or other approved sign. Letters shall be a minimum height of 2 inches (51 mm) with a minimum stroke of 3/8 inch (10 mm) and on a contrasting background.

415.7.4 Door size and type. Fire department access doors shall be not less than 3 feet (914 mm) in width and 6 feet 8 inches (2032 mm) in height. Roll up doors shall not be considered fire department access doors unless approved.

415.7.5 Locking devices. Locking devices on fire department access doors shall be approved.

415.7.6 Key box. Where fire department access doors are required, a key box shall be installed in accordance with Section 506.1 of the International Fire Code. The key box shall contain keys or devices to allow for entry through the fire department access doors.

Reason:

This section specifies when Group H occupancies are required to have their perimeter on an exterior wall. According to the International Building Code Commentary, Section 415.6, this is "in order to provide adequate access for fire-fighting operations and venting of the products of combustion..." Also, Section 507.8.2 states "more ready access to the high-hazard occupancy from the exterior of the building gives the fire department the opportunity to respond more effectively to an incident." Applicants with large H occupancies don't always plan for an exterior door in the H room. Or if there is a door, it's not always in a location that allows for fire department access. Designers have pointed out that although the code requires the H occupancy to be on an exterior wall, the code does not require a door for fire department access. Since the intent of this section is to give the fire department access to the high-hazard occupancy from the exterior of the building, the fire code official should have the ability to require an exterior door in a location approved for fire department access. One of the legacy codes required an exterior access door for Liquid Use, Dispensing and Mixing Rooms and Liquid Storage Rooms over 500 square feet, but that requirement did not make the transition to the International Building Code. The code commentary does not address why it was not included in the International Building Code. This code change proposal would re-establish that requirement.

To be consistent with other parts of the code, the requirements for the fire department access door are consistent with the requirements for fire department access doors in the International Fire Code, Chapter 32, Section 3206.7.

Cost Impact

The code change proposal will increase the cost of construction .

If the applicant did not already plan to install an exterior door in the H occupancy room, this code change proposal will increase the cost of construction by the cost to install an exterior door. If the applicant is moving into an existing building, there may be an existing door that would work for fire department access. So in some cases there would be no change in the cost of construction and in other cases there would be a minimal cost increase.

Internal ID: 1015

G51-18

IBC: [F]415.9, [F]415.9.1, [F]415.9.1.1, [F]415.9.1.1.1, [F]415.9.1.2, [F]415.9.1.3, [F]415.9.1.4, [F]415.9.1.5, [F]415.9.1.6, [F]415.9.1.7, [F]415.9.1.8, [F]415.9.1.9, [F]415.9.2, [F]415.9.3, [F]415.10, [F]415.10.1, [F]415.10.2, [F]415.10.3, [F]415.10.4

Proponent: Ellie Klausbruckner, Klausbruckner & Associates Inc., representing Klausbruckner & Associates, Inc. (ek@klausbruckner.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

[F] 415.9 Group H-2, H-3 and H-4. Occupancies in Group H-2, H-3 and H-4 shall be constructed in accordance with Sections 415.9.1 through 415.9.3 the applicable provisions of this code, the International Mechanical Code and the International Fire Code.

[F] 415.9.1 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids in Group H-2 and H-3 occupancies shall be in accordance with Sections 415.9.1.1 through 415.9.1.9 the applicable provisions of this chapter, the International Mechanical Code and the International Fire Code.

Add new text as follows:

415.9.1.1 Flammable and combustible liquid tanks. The storage of flammable and combustible liquids in stationary tanks utilized for associated operations of building equipment or machinery in Group H-2 and H-3 occupancies, where the storage tank is located in a building of two or more occupancies, is not subject to height limitations of Section 504 where the following conditions exist:

1. The H-2 or H-3 use is separated from adjacent occupancies in accordance with the requirements of Section 508.4.
2. Where the storage tank is located within not more than one story of the building.
3. Where the tank and the room is designed, installed and protected in accordance with Sections 415.9.1.1.1 through 415.9.1.1.8.

Delete without substitution:

[F] 415.9.1.1 Mixed occupancies. ~~Where the storage tank area is located in a building of two or more occupancies and the quantity of liquid exceeds the maximum allowable quantity for one control area, the use shall be completely separated from adjacent occupancies in accordance with the requirements of Section 508.4.~~

[F] 415.9.1.1.1 Height exception. ~~Where storage tanks are located within a building not more than one story above grade plane, the height limitation of Section 504 shall not apply for Group H.~~

Revise as follows:

[F] 415.9.1.2 415.9.1.1.1 Tank protection. Storage tanks shall be noncombustible and protected from physical damage. *Fire barriers or horizontal assemblies* or both around the storage tanks shall be permitted as the method of protection from physical damage.

[F] 415.9.1.3 415.9.1.1.2 Tanks. Storage tanks shall be approved tanks conforming to the requirements of the International Fire Code.

[F] 415.9.1.4 415.9.1.1.3 Leakage containment. A liquid-tight containment area compatible with the stored liquid shall be provided. The method of spill control, drainage control and secondary containment shall be in accordance with the International Fire Code.

Exception: Rooms where only double-wall storage tanks conforming to Section 415.9.1.3 are used to store Class I, II and IIIA flammable and combustible liquids shall not be required to have a leakage containment area.

[F] ~~415.9.1.5~~ 415.9.1.1.4 Leakage alarm. An *approved* automatic alarm shall be provided to indicate a leak in a storage tank and room. The alarm shall sound an audible signal, 15 dBA above the ambient sound level, at every point of entry into the room in which the leaking storage tank is located. An *approved* sign shall be posted on every entry door to the tank storage room indicating the potential hazard of the interior room environment, or the sign shall state: WARNING, WHEN ALARM SOUNDS, THE ENVIRONMENT WITHIN THE ROOM MAY BE HAZARDOUS. The leakage alarm shall be supervised in accordance with Chapter 9 to transmit a trouble signal.

[F] ~~415.9.1.6~~ 415.9.1.1.5 Tank vent. Storage tank vents for Class I, II or IIIA liquids shall terminate to the outdoor air in accordance with the International Fire Code.

[F] ~~415.9.1.7~~ 415.9.1.1.6 Room ventilation. Storage tank areas storing Class I, II or IIIA liquids shall be provided with mechanical *ventilation*. The mechanical *ventilation system* shall be in accordance with the International Mechanical Code and the International Fire Code.

[F] ~~415.9.1.8~~ 415.9.1.1.7 Explosion venting. Where Class I liquids are being stored, explosion venting shall be provided in accordance with the International Fire Code.

[F] ~~415.9.1.9~~ 415.9.1.1.8 Tank openings other than vents. Tank openings other than vents from tanks inside buildings shall be designed to ensure that liquids or vapor concentrations are not released inside the building.

[F] 415.9.2 Liquefied petroleum gas facilities. The construction and installation of liquefied petroleum gas facilities shall be in accordance with the requirements of this code, the International Fire Code, the International Mechanical Code, the International Fuel Gas Code and NFPA 58.

[F] 415.9.3 Dry cleaning plants. The construction and installation of dry cleaning plants shall be in accordance with the requirements of this code, the International Mechanical Code, the International Plumbing Code and NFPA 32. Dry cleaning solvents and systems shall be classified in accordance with the International Fire Code.

Delete without substitution:

~~[F] 415.10 Groups H-3 and H-4.~~ Groups H-3 and H-4 shall be constructed in accordance with the applicable provisions of this code and the International Fire Code.

~~[F] 415.10.1 Flammable and combustible liquids.~~ The storage, handling, processing and transporting of flammable and combustible liquids in Group H-3 occupancies shall be in accordance with Section 415.9.1.

Revise as follows:

[F] ~~415.10.2~~ 415.9.4 Gas rooms. Where gas rooms are provided, such rooms shall be separated from other areas by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

[F] ~~415.10.3~~ 415.9.5 Floors in storage rooms. Floors in storage areas for corrosive liquids and highly toxic or toxic materials shall be of liquid-tight, noncombustible construction.

[F] ~~415.10.4~~ 415.9.6 Separation of highly toxic solids and liquids. Highly toxic solids and liquids not stored in *approved* hazardous materials storage cabinets shall be isolated from other hazardous materials storage by not less than 1-hour fire barriers constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason:

The original code sections in 415.9.1 came from the BOCA Building Code. It is our understanding that the intent was to allow tanks inside the building at a time when they were not allowed by NFPA 30. As an example a generator or fire pump, along with the associated diesel fuel tank could be allowed in the basement of a building. The room housing the tank would not be subject to height limitations if the tank and the room housing the tank was only one story tall. Please see attached original BOCA Building Code language. At some point, a decision was made to replace language such as "one story" to "one story above grade plane" throughout the code for other reasons such as consistency (e.g. in allowable area sections in Chapter 5). The language in this section accidentally changed from "one story" meaning the tank is only on a single floor to "one story above grade" in 415.9.1.1.1. The proposed code change clarifies the original intent of this code section. Also the language used to imply that the H-Occupancy is allowed on the different floors regardless of what else may be in the room. It is intended for tanks used for servicing building equipment. The

language as it is currently written implies facilities (such as major chemical manufacturing, etc.) with tanks can be on upper floors which is not the intent of this section.

418.2.1 Construction: Occupancies in Use Group H-1 shall not be located in buildings that are more than one story in height, have basements or other spaces below grade, or which are attached to other buildings. The minimum fire separation distance for all exterior walls of occupancies in Use Group H-1 shall be in accordance with the fire prevention code listed in Chapter 35. All floor surfaces shall be spark resistant.

418.2.2 Number of exits: There shall not be less than two exits from any area or space wherein Use Group H-1 materials are utilized or stored. All required exits shall discharge directly to the exterior of the building or structure.

418.3 Use Group H-2: Occupancies in Use Group H-2 shall be constructed in accordance with Sections 418.3.1 through 418.3.4 and the fire prevention code listed in Chapter 35.

418.3.1 Combustible dusts, grain processing and storage: The provisions of Sections 418.3.1.1 through 418.3.1.6 shall apply to all buildings in which materials that produce combustible dusts are stored or handled. Buildings which store or handle combustible dusts shall comply with the applicable provisions of NFPA 61, 65, 120, 651, 654, 655, 664 and 8503 and the fire prevention code listed in Chapter 35.

418.3.1.1 Type of construction and height exceptions: All buildings shall be of Type 1, Type 2 or Type 4 construction, within the height and area limitations of Table 503 for Use Group H-2; except that where erected of Type 1 or Type 2 construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type 4 construction, the maximum height shall be 65 feet (19812 mm) and except further that, in isolated areas, the maximum height of Type 4 structures shall be increased to 85 feet (25908 mm).

418.3.1.2 Grinding rooms: Every room or space occupied for grinding or other operations that produce combustible dusts shall be enclosed with floors and walls that have not less than a 2-hour fire-resistance rating where the area is not more than 3,000 square feet (279 m²), and not less than a 4-hour fire-resistance rating where the area is greater than 3,000 square feet (279 m²).

418.3.1.3 Conveyors: All conveyors, chutes, piping and similar equipment passing through the enclosures of rooms or spaces shall be constructed fire tight and vapor tight, and be of approved noncombustible materials complying with Section 3010.0.

418.3.1.4 Explosion relief: Means for explosion relief shall be provided as specified in Section 417.5.1, or spaces shall be equipped with the equivalent mechanical ventilation complying with the mechanical code listed in Chapter 35.

418.3.1.5 Grain elevators: Grain elevators, tank houses and buildings for similar occupancies shall not be located within 30 feet (9144 mm) of interior lot lines or structures on the same lot, except where erected along a railroad right-of-way.

418.3.1.6 Coal pockets: Coal pockets located less than 30 feet (9144 mm) from interior lot lines or from structures on the same lot shall be constructed of not less than Type

2A construction. Where more than 30 feet (9144 mm) from interior lot lines, or where erected along a railroad right-of-way, the minimum type of construction of such structures not more than 65 feet (19812 mm) in height shall be Type 4.

418.3.2 Flammable and combustible liquids: The storage, handling, processing and transporting of flammable and combustible liquids shall be in accordance with the mechanical code and the fire prevention code listed in Chapter 35. Where a Class I, II or IIIA flammable or combustible liquid is stored in tanks inside the building, the installation shall conform to Sections 418.3.2.1 through 418.3.2.10 and NFPA 30 listed in Chapter 35. The requirements shall only apply where tanks have an individual storage capacity that exceeds the exempt amounts specified in Tables 307.8(1) and 307.8(2). The fire area containing the tank(s) shall be classified as Use Group H-2.

418.3.2.1 Mixed use groups: Where the storage tank area is located in a building of two or more use groups, the Use Group H-2 fire area shall be completely separated from adjacent fire areas in accordance with the requirements of Section 313.1.2.

418.3.2.1.1 Height exception: Where storage tanks are located within only a single story, the height limitation of Section 503.3 shall not apply for the Use Group H-2 fire area.

418.3.2.2 Tank protection: All storage tanks shall be noncombustible and protected from physical damage. A fire separation assembly around the storage tank(s) shall be permitted to be classified as the method of protection from physical damage.

418.3.2.3 Tanks for Class I flammable liquid: All storage tanks for Class I flammable liquid shall be double-walled tanks. A double-walled tank shall consist of an approved tank conforming to the requirements of the fire prevention code listed in Chapter 35, installed within a completely enclosed noncombustible containment structure. The containment structure shall prevent the stored liquid from escaping into the room or area in which the tank is located. A leak detection alarm shall be provided to identify a leak of the primary wall of the tank. The alarm shall conform to Section 418.3.2.6.

418.3.2.4 Suppression: The Use Group H-2 fire area shall be equipped throughout with an approved automatic fire sprinkler system, installed in accordance with Section 906.2.1, or with a foam-extinguishing system. The automatic fire suppression system shall be supervised by method 1 of Section 924.1.

418.3.2.5 Leakage containment: A liquid-tight containment area compatible with the stored liquid shall be provided to retain 110 percent of the entire capacity of all the storage liquid in the event of a leak in a tank plus the capacity of the automatic fire suppression system activated for a period of 30 minutes. The storage tanks and the leakage containment area shall be provided with an ap-

proved method to drain manually the flammable or combustible liquid.

Exception: Rooms where only double-wall storage tanks conforming to Section 418.3.2.3 are used to store Class I, II and IIIA flammable and combustible liquids shall not be required to have a leakage containment area.

418.3.2.6 Leakage alarm: An approved automatic alarm shall be provided to indicate a leak in a storage tank and room. The alarm shall sound an audible signal, 15 dBA above the ambient sound level, at every point of entry into the room in which the leaking storage tank is located. An approved sign shall be posted on every entry door to the tank storage room indicating the potential hazard of the interior room environment, or the sign shall state, "Warning, when alarm sounds, the environment within the room may be hazardous." The leakage alarm shall also be supervised in accordance with Section 924.2 to transmit a trouble signal.

418.3.2.7 Tank vent: Storage tank vents shall terminate to the outdoor air. The vent termination shall be in an approved location a minimum of 12 feet (3658 mm) above adjacent ground level and 10 feet (3048 mm) from a fire, ventilation intake opening, operable window or door.

418.3.2.8 Room ventilation: Storage tank areas storing Class I liquids, or Class II or IIIA liquids at temperatures above flash point, shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25 percent of the lower explosive limit. Ventilation requirements shall be determined by either calculations based on anticipated fugitive emissions or by sampling of the actual vapor concentration levels under normal operating conditions. The sampling shall be conducted at a 5-foot radius from each potential vapor source in the storage area. Provision shall be made for make-up air to avoid short-circuiting the ventilation.

418.3.2.9 Explosion venting: Where Class I liquids are being stored, explosion venting shall be provided in accordance with Section 417.5.

418.3.2.10 Tank openings other than vents: Tank openings other than vents from tanks inside buildings shall be designed to ensure that liquids or vapor concentrations are not released inside the building and shall conform to Sections 418.3.2.10.1 through 418.3.2.10.5.

418.3.2.10.1 Liquid tight: All tank openings at the maximum liquid level or below shall be liquid tight.

418.3.2.10.2 Closed: All tank openings above the maximum liquid level shall be normally closed.

418.3.2.10.3 External valve: Each connection through which liquid is capable of gravity flow from a tank inside a building shall be provided with an external valve located as close as practical to, but not more than 2 feet from, the shell of the tank.

418.3.2.10.4 Valves on transfer connections: Tanks storing Class I or Class II liquids shall be provided with

either a normally closed, remotely activated valve or an automatic-closing, heat-activated valve or other approved device on each liquid transfer connection below the liquid level, except for connections utilized for emergency disposal.

418.3.2.10.5 Overflow protection: Tanks shall be equipped with a device, or other means provided, to prevent overflow into the building.

418.3.3 Liquefied petroleum gas distribution facilities: The design and construction of propane, butane, propylene, butylene and other liquefied petroleum gas distribution facilities shall conform to the applicable provisions of Sections 418.3.3.1 through 418.3.3.2. The storage and handling of liquefied petroleum gas systems shall conform to the fire prevention code listed in Chapter 35. The design and installation of piping, equipment and systems which utilize liquefied petroleum gas shall be in accordance with the mechanical code listed in Chapter 35. Liquefied petroleum gas distribution facilities shall be ventilated in accordance with the mechanical code listed in Chapter 35 and Section 418.3.3.1.

418.3.3.1 Air movement: Liquefied petroleum gas distribution facilities shall be provided with air inlets and outlets arranged so that air movement across the floor of the facility will be uniform. The total area of both inlet and outlet openings shall be at least 1 square inch (645 mm²) for each 1 square foot (0.093 m²) of floor area. The bottom of such openings shall not be more than 6 inches (152 mm) above the floor.

418.3.3.2 Construction: Liquefied petroleum gas distribution facilities shall be constructed in accordance with Section 418.3.3.3 for separate buildings, Section 418.3.3.4 for attached buildings or Section 418.3.3.5 for rooms within buildings.

418.3.3.3 Separate buildings: Where located in separate buildings, liquefied petroleum gas distribution facilities shall be occupied exclusively for that purpose or for other purposes having similar hazards. Such buildings shall be limited to one story in height and shall conform to Sections 418.3.3.3.1 and 418.3.3.3.2.

418.3.3.3.1 Floors: The floor shall not be located below ground level and any spaces beneath the floor shall be solidly filled or shall be left unenclosed.

418.3.3.3.2 Materials: Walls, floors, ceilings, columns and roofs shall be constructed of noncombustible materials. Exterior walls, ceilings and roofs shall be constructed of material designed for explosion venting or, if of heavy construction such as solid brick masonry, concrete block or concrete, explosion-venting windows or panels in walls or roofs shall be provided having an explosion-venting area of at least 1 square foot (0.093 m²) for each 50 cubic feet (1.40 m³) of enclosed volume.

418.3.3.4 Attached buildings: Where liquefied petroleum gas distribution facilities are located in an attached structure, the attached perimeter shall not exceed 50 percent of the perimeter of the space enclosed and the facility shall comply with Sections 418.3.3.3 and 418.3.3.4.1. Where

Cost Impact

The code change proposal will not increase or decrease the cost of construction.

This is an editorial change to clean up the language and clarify what was intended by the code sections.

Internal ID: 1776

G52-18

IBC: [F]415.11.3.5, [F]415.11.3.5.1, [F]415.11.3.5.2, [F]415.11.3.5.3, [F]415.11.3.5.4, [F]415.11.3.5.5

Proponent: Patrick McLaughlin, representing Self (pmclaugma@aol.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

[F] ~~415.11.3.5~~ **415.11.4 Emergency alarm system.** *Emergency alarm systems* shall be provided in accordance with this section and Sections 415.5.1 and ~~415.5.2~~ 415.5.2. The maximum allowable quantity per *control area* provisions shall not apply to *emergency alarm systems* required for HPM.

[F] ~~415.11.3.5.1~~ **415.11.4.1 Service corridors.** An *emergency alarm system* shall be provided in *service corridors*, with not fewer than one alarm device in each *service corridor*.

[F] ~~415.11.3.5.2~~ **415.11.4.2 Corridors and interior exit stairways and ramps.** Emergency alarms for *corridors*, *interior exit stairways* and *ramps* and *exit passageways* shall comply with Section ~~415.5.2~~ 415.5.2.

[F] ~~415.11.3.5.3~~ **415.11.4.3 Liquid storage rooms, HPM rooms and gas rooms.** Emergency alarms for liquid storage rooms, HPM rooms and gas rooms shall comply with Section ~~415.5.1~~ 415.5.1.

[F] ~~415.11.3.5.4~~ **415.11.4.4 Alarm-initiating devices.** An *approved* emergency telephone system, local alarm manual pull stations, or other *approved* alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

[F] ~~415.11.3.5.5~~ **415.11.4.5 Alarm signals.** Activation of the *emergency alarm system* shall sound a local alarm and transmit a signal to the emergency control station.

Reason:

This proposal simply pulls the emergency alarm requirements for semi-conductors out of the section on Service corridors. This is simply an editorial change as the emergency alarm system requirements should stand on their own.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This truly is a clarification and clean up of the code to properly place emergency alarm systems in their own subsection outside of the requirements for service corridors.

Internal ID: 282

G53-18

IBC: 420.4 (New)

Proponent: Sarah Rice, representing Myself (srice@preview-group.com)

2018 International Building Code

Add new text as follows:

420.4 Fire-resistance rating. Fire partitions and horizontal assemblies separating dwelling or sleeping units in the same building, and dwelling or sleeping units from other occupancies shall have a fire-resistance rating of not less than 1 hour.

Exception: Dwelling unit and sleeping unit separations in buildings of Types IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason:

Section 420 is where the requirement for dwelling and sleeping units to be separated from each other and other occupancies is found. Currently it tells the code user that the walls must be fire partitions and the floors must be horizontal assemblies, but in order to know what the fire ratings are to these assemblies you are forced to go to Sections 708.3 and 711.2.3. This code change proposes to bring the fire ratings into Section 420.

708.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour.

Exceptions:

1. Corridor walls permitted to have a 1/2-hour fire resistance rating by Table 1020.1.
2. Dwelling unit and sleeping unit separations in buildings of Types IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Dwelling unit and sleeping unit separations in buildings of Types IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

711.2.3 Supporting construction. The supporting construction shall be protected to afford the required fire resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 509 provided that the required fire-resistance rating does not exceed 1 hour.
2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 420.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is simply a correlative code change, duplicating information found in another section of the code.

Internal ID: 2376

G54-18

IBC: 420.2, 705.3

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

420.2 Separation walls. Walls separating *dwelling units* in the same building, walls separating *sleeping units* in the same building and walls separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *fire partitions* in accordance with Section 708. Exterior walls separating units shall comply with Section 705.3.

Exceptions:

1. Where sleeping units include private bathrooms, walls between bedrooms and the associated private bathrooms are not required to be constructed as fire partitions.
2. Where sleeping units are constructed as suites, walls between bedrooms within the sleeping unit and the walls between the bedrooms and associated living spaces are not required to be constructed as fire partitions.
3. In Group R-3 and R-4 facilities, walls within the dwelling units or sleeping units are not required to be constructed as fire partitions.

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, projections and roof-covering requirements, buildings on the same lot and portions of the same building requiring dwelling or sleeping unit separation shall be assumed to have an imaginary line between them. Section 705.3 Exception 1 shall not be used where dwelling or sleeping unit separation is required.

Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exceptions:

1. Two or more buildings on the same lot shall be either regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.
2. Where an S-2 parking garage of Construction Type I or IIA is erected on the same lot as a Group R-2 building, and there is no *fire separation distance* between these buildings, then the adjoining *exterior walls* between the buildings are permitted to have occupant use openings in accordance with Section 706.8. However, opening protectives in such openings shall only be required in the exterior wall of the S-2 parking garage, not in the exterior wall openings in the R-2 building, and these opening protectives in the exterior wall of the S-2 parking garage shall be not less than 1¹/₂-hour *fire protection rating*.

Reason:

The code requires fire-rated construction between dwelling units, but does not specifically address the situation where the separating wall is exterior. The provisions of 705.3 establish a means to determine the required fire rating and allowable openings for exterior walls of two buildings on the same lot. The same principles should be applied to the requirements for dwelling unit separation.

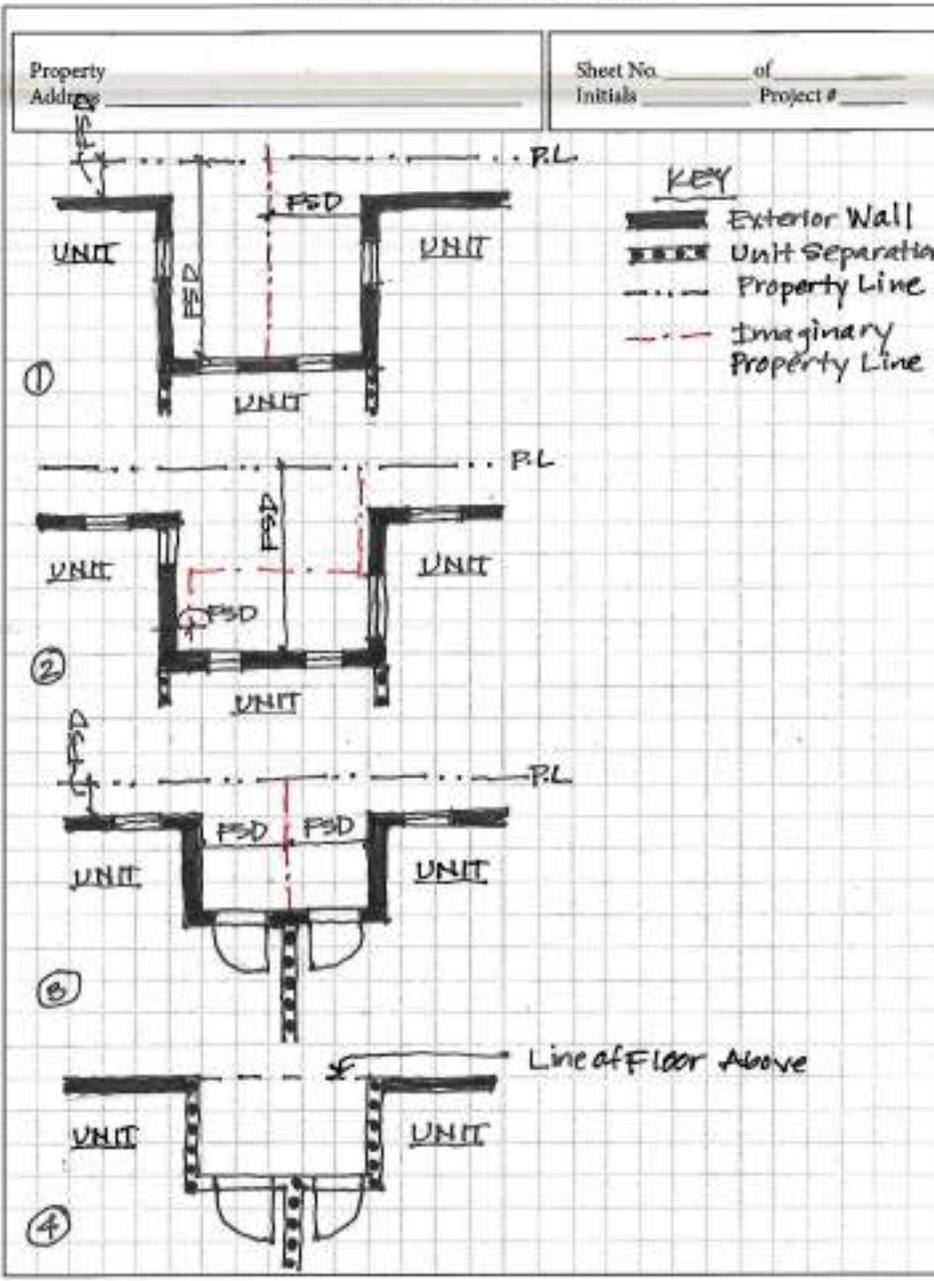
Dwelling unit separation is intended to prevent a fire in one unit from spreading to other units in a building. If adjacent units have unprotected openings in close proximity, fire can more readily spread between units, and to exterior balconies, cladding and roof.

With increasing demand for greater density housing, architects are designing more multifamily residential buildings with smaller units, often with windows on opposite sides of courts.

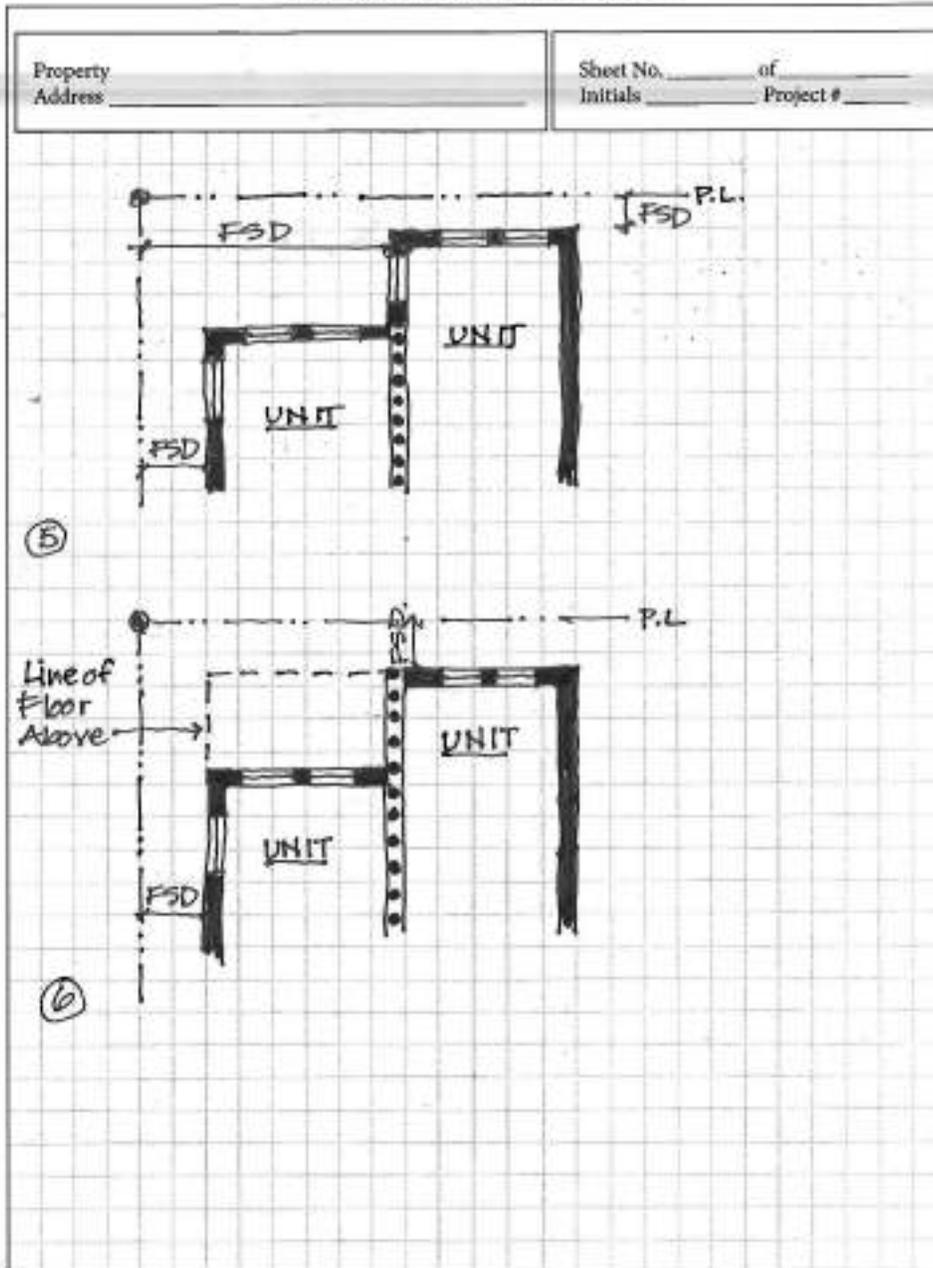
The provisions of Section 1206 control the minimum sizes of courts, but are silent on the fire-rating requirements, as this section is focused on light and ventilation.

This revision will provide greater clarity for designers and increased safety and privacy for building residents.

Plan Review Calculations DPD



Plan Review Calculations DPD



Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Minimal cost implications for construction. Potential property damage and life savings as fires are more likely to be limited to the unit of origin.

Internal ID: 1658

G55-18

IBC: 420.8, 420.8.1, 420.9 (New);

IFC: 904.13 (IBC[F] 904.13)

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

420.7 Group I-1 assisted living housing units. In Group I-1 occupancies, where a fire-resistance corridor is provided in areas where assisted living residents are housed, shared living spaces, group meeting or multipurpose therapeutic spaces open to the corridor shall be in accordance with all of the following criteria:

1. The walls and ceilings of the space are constructed as required for corridors.
2. The spaces are not occupied as resident sleeping rooms, treatment rooms, incidental uses in accordance with Section 509, or hazardous uses.
3. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
4. In Group I-1, Condition 1, the corridors onto which the spaces open are protected by an automatic fire detection system installed in accordance with Section 907, or the spaces are equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
5. In Group I-1, Condition 2, the corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the *smoke compartment* in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
6. The space is arranged so as not to obstruct access to the required *exits*.

Revise as follows:

420.8 Group I-1 cooking facilities. In Group I-1 occupancies, rooms or spaces that contain a cooking facilities facility with domestic cooking appliances shall ~~be in accordance with~~ be permitted to be open to the corridor where all of the following criteria are met:

1. In Group I-1, Condition 1 occupancies, the number of care recipients served by one cooking facility shall not be greater than 30.
2. In Group I-1, Condition 2 occupancies, the number of care recipients served by one cooking facility and within the same smoke compartment shall not be greater than 30.
- ~~3. The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.~~
- ~~4.3. The space containing the domestic cooking facilities shall be arranged so as not to obstruct access to the required exit.~~
- ~~5.4. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges. The cooking appliances shall comply with Section 420.9.~~
- ~~6. Cooktops and ranges shall be protected in accordance with Section 904.13.~~
- ~~7. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff.~~
- ~~8. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.~~
- ~~9. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30 foot (9144 mm) distance of travel from each domestic cooking appliance.~~

Delete without substitution:

~~**420.8.1 Cooking facilities open to the corridor.** Cooking facilities located in a room or space open to a corridor, aisle or common space shall comply with Section 420.8.~~

420.9 Domestic cooking appliances. In Group I-1 occupancies, installation of cooking appliance used in domestic cooking facilities shall comply with all of the following:

1. The types of cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.
2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges.
3. Cooktops and ranges shall be protected in accordance with Section 904.13.
4. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff.
5. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
6. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.

2018 International Fire Code

Revise as follows:

904.13 Domestic cooking systems facilities. Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.13.1:

1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section ~~420.8~~ 420.9 of the International Building Code.
2. In Group I-2, Condition 1 occupancies where domestic cooking facilities are installed in accordance with Section 407.2.6 of the International Building Code.
3. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.10 of the International Building Code.

Reason:

The intent of this proposal is for no technical change, but is to separate the requirements for domestic cooking appliances and exhaust from the allowance for that area to be open to the corridor in an assisted living facility. If someone wants to do a domestic cooking area in a room, such as for therapy or nutrition counseling purposes, they would still have to follow all the domestic cooking regulations for the equipment. This is also coordinated with the language for Group I-2, Condition 2 requirements in Section 407. This is not intended to change any of the provisions for the commercial cooking areas. The change in IFC is correlation only.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is an editorial separation with no technical changes for cooking facilities open to the corridor. This is a clarification of a domestic cooking appliance if it is within a room in a Group I-1 (assisted living). Currently some code officials would ask for commercial hoods, others would ask for domestic hoods.

Internal ID: 1296

G56-18

IBC: 420.8

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows:

420.8 Group I-1 cooking facilities. In Group I-1 occupancies, rooms or spaces that contain cooking facilities with domestic cooking appliances shall be in accordance with all of the following criteria:

1. In Group I-1, Condition 1 occupancies, the number of care recipients served by one cooking facility shall not be greater than 30.
2. In Group I-1, Condition 2 occupancies, the number of care recipients served by one cooking facility and within the same smoke compartment shall not be greater than 30.
3. The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.
4. The space containing the domestic cooking facilities shall be arranged so as not to obstruct access to the required exit.
5. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges.
6. Cooktops and ranges shall be protected in accordance with Section 904.13.
7. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff.
8. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
9. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.

Exceptions:

1. Cooking facilities provided within care recipient's individual dwelling units are not required to comply with this section.
2. Cooktops and ranges used for care recipient training or nutritional counseling are not required to comply with Item 6 of this section.

Reason:

If the proposal to split this section is also accepted, the exceptions would be applicable to the new section dealing with the cooktops and ranges.

This section was originally added to the code to allow assisted living facilities to have a more home like atmosphere, including small dining rooms and kitchen areas available to serve and possibly used by residents. The intent of this proposal is to allow for some exceptions for other domestic cooking.

Exception 1 - In Group I-1, Condition 1, sometimes there is limited cooking permitted within the units. In these limited situations additional protection, shut offs, timers and additional portable fire extinguishers are not justified.

Exception 2 - The idea of this proposal for kitchens in therapy areas or for nutrition counseling to not have to provide the UL300A hood protection features required to kitchens shared by care recipients.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Cooktops and ranges used for domestic purposes would still have to comply with the IMC for ventilation. This is a clarification for where additional protection, shut offs, timers and additional portable fire extinguishers are not needed.

Internal ID: 1303

G57-18

IBC: 422.2

Proponent: Drew Dorrance, South Salt Lake City, representing South Salt Lake City (drd_007@hotmail.com)

2018 International Building Code

Revise as follows:

422.2 Separation. Ambulatory care facilities where the potential for four or more care recipients are to be incapable of self-preservation at any time shall be separated from adjacent spaces, corridors or tenants with a fire partition and a fire-rated horizontal assembly installed in accordance with ~~Section~~ Sections 708 and 711.2

Reason:

Currently IBC section 422.2 addresses the vertical separation between ambulatory and non ambulatory care spaces. This section does not address a horizontal separation, when the same situation arises.

Cost Impact

The code change proposal will increase the cost of construction .

The cost for this change is directly impacted by the cost of a fire rated horizontal assembly, to include supporting construction.

Internal ID: 1471

G58-18

IBC: 422.1, 422.7 (New)

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows:

422.1 General. Occupancies classified as *ambulatory care facilities* shall comply with the provisions of Sections 422.1 through ~~422.6~~422.7 and other applicable provisions of this code.

Add new text as follows:

422.7 Domestic cooking. Installation of cooking appliances used in domestic cooking facilities shall comply with all of the following:

1. The types of cooking appliances permitted are limited to ovens, cooktops, ranges, warmers and microwaves
2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges.
3. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff.
4. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
5. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.

Reason:

Physical therapy areas sometimes have kitchens to train patients in how to operate safely when they are cooking at home or as part of nutrition counseling. If a domestic cooking facility is set up in an ambulatory care facility for physical therapy or training, it should be treated the same as in Group I-1 and I-2 for similar areas.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will increase the cost of construction .

Where someone wanted a cooking appliance for therapy or nutritional training, this would be an increase in requirements for the range and associated hood.

Internal ID: 1307

G59-18

IBC: 423.1, 423.2, 423.3 (New), 423.3.1 (New), 423.3.2 (New)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

SECTION 423 STORM SHELTERS

Revise as follows:

423.1 General. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as rooms or spaces within buildings for the purpose of providing protection from storms that produce high winds, such as tornadoes and hurricanes during the storm. ~~Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado.~~ This section specifies where storm shelters are required and provides requirements for the design and construction of storm shelters. Design of facilities for use as emergency shelters after the storm are outside the scope of ICC 500 and shall comply with Table 1604.5 as a Risk Category IV Structure.

423.2 Construction. ~~In addition to other applicable requirements in this code, storm~~ Storm shelters shall be constructed in accordance with this code and ICC 500, and shall be designated as hurricane shelters, tornado shelters, or combined hurricane and tornado shelters. Buildings or structures that are also designated as emergency shelters shall also comply with Table 1604.5 as Risk Category IV structures. Any storm shelter not required by this section shall be permitted to be constructed provided such structures meet the requirements of this code and ICC 500.

Add new text as follows:

423.3 Occupancy classification. The occupancy classification for a storm shelter shall be determined in accordance with this section.

423.3.1 Dedicated storm shelters. A facility designed to be occupied solely as a storm shelter shall be classified as Group A-3 for the determination of requirements other than those covered in ICC 500.

Exceptions:

1. The occupancy category for dedicated storm shelters with an occupant load of less than 50 persons as determined in accordance with ICC 500 shall be in accordance with Section 303.
2. The occupancy category for a dedicated residential storm shelter shall be the Group R occupancy served.

423.3.2 Storm shelters within host buildings. Where designated storm shelters are constructed as a room or space within a host building which will normally be occupied for other purposes, the requirements of this code for the occupancy of the building, or the individual rooms or spaces thereof, shall apply unless otherwise required by ICC 500.

Reason:

ICC 500 contains specific requirements for determining the occupancy classification of storm shelters, whether constructed as a standalone building or as a room or space inside a host building which will normally be occupied for other purposes (e.g. a multi-purpose room in a Group E school or a conference room in a Group B office building). This code change adapts the occupancy language from ICC 500 and adds it to Section 423 where it will be directly accessible to all code users.

Occupancy classifications for storm shelters are broken down into four categories:

Dedicated storm shelters: Large community storm shelters may house hundreds of occupants. Thus, the ICC 500 committee deemed it appropriate to classify these shelters as Assembly Group A-3.

Small dedicated storm shelters: Some community shelters may only serve a small number of occupants. The ICC 500 committee deemed it appropriate to permit these smaller shelters to be classified as Group B as allowed by IBC Section 303.1.1

Shelters in a host building: Storm shelters constructed within a larger building as a room or space which will be used for other purposes under normal conditions (e.g. a multi-purpose room in a Group E school or a conference room in a Group B office building) are permitted to be classified using the occupancy category applicable to the space as it is normally used.

Residential storm shelters. Currently under ICC 500 these would be classified as Group B since they are limited to a maximum of 16 occupants, thus could use the Section 303.1.1 allowance. It is more appropriate that they be classified as Group R since that is the occupancy to which they are an accessory structure.

In addition, Sections 423.1 (General) and 423.2 (Construction) are revised to provide better scoping and charging language for storm shelters. The General paragraph is amended to highlight that Section 423 contains language requiring the installation of storm shelters in critical facilities such as fire stations, ambulance stations, and emergency operations centers (existing Section 423.3) and in Group E occupancies (existing Section 423.4). The requirement to classify storm shelters as hurricane, tornado, or both is relocated to the Construction provision, and a new paragraph is added to clarify that a storm shelter may be constructed in, or accessory to, any other buildings or structures governed by the IBC, where they would not otherwise be required, as long as the shelter complies with the appropriate requirements of the IBC and ICC 500. This is similar to language that exists in Section 901.2 for fire protection systems.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal clarifies the occupancy classifications of storm shelters by adding the requirements from ICC 500 to Section 423.

Internal ID: 2261

G60-18

IBC: 423.3, 423.4, 423.4.1, 423.4.2

Proponent: Benchmark Harris, representing self (bharris@huckabee-inc.com)

2018 International Building Code

Revise as follows:

423.3 Critical emergency operations. In areas where the shelter design wind speed for tornados in accordance with Figure 304.2(1) of ICC 500 is 250 mph, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall comply with Table 1604.5 as a Risk Category IV structure and shall be provided with a tornado storm shelter constructed in accordance with ICC 500.

423.4 Group E occupancies. In areas where the shelter design wind speed for tornados is 250 mph in accordance with Figure 304.2(1) of ICC 500, all Group E occupancies with an occupant load of 50 or more shall have a tornado storm shelter constructed in accordance with ICC 500.

Exceptions:

1. Group E day care facilities.
2. Group E occupancies accessory to places of religious worship.
3. Buildings meeting the requirements for tornado storm shelter design in ICC 500.

423.4.1 Required occupant capacity. The required occupant capacity of the tornado storm shelter shall include all of the buildings on the site and shall be the greater of the following:

1. The total occupant load of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The occupant load of any indoor assembly space that is associated with the Group E occupancy.

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the code official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing tornado storm shelters on the site.

423.4.2 Location. Storm shelters shall be located within the buildings they serve or shall be located where the maximum distance of travel from not fewer than one exterior door of each building to a door of the tornado storm shelter serving that building does not exceed 1,000 feet (305 m).

Reason:

A storm shelter can be a tornado shelter, hurricane shelter or both. The design wind speed and debris impact criteria are less for hurricane shelters than for tornado shelters with a design wind speed of 250 mph. The intent of this provision is to require tornado storm shelters, not hurricane storm shelters.

For example, Guam is located in a region in which the design wind speed is 250 mph but they are also in a hurricane prone region where the design wind speed for hurricane shelters is less than 250 mph. This proposed change clarifies that it is not acceptable for a location like Guam to simply construct a hurricane storm shelter for E occupancy buildings with greater than 50 occupants; it is required to construct either a tornado storm shelter or a combined tornado and hurricane storm shelter.

Substantiation to support proposed change:

The following is an excerpt from “**Chapter 2: Definitions**” of THE 2018 IBC:

STORM SHELTER. A building, structure or portions thereof, constructed in accordance with ICC 500 and designated for use during a severe wind storm event, such as a hurricane or tornado.

Community storm shelter. A storm shelter not defined as a “Residential storm shelter.”

Residential storm shelter. A storm shelter servicing occupants of dwelling units and having an occupant load not exceeding 16 persons.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is to clarify the original code intent.

Internal ID: 2163

G61-18

IBC: 423.4

Proponent: Benchmark Harris, representing Self (bharris@huckabee-inc.com)

2018 International Building Code

Revise as follows:

423.4 Group E occupancies. In areas where the shelter design wind speed for tornados is 250 mph in accordance with Figure 304.2(1) of ICC 500, all Group E occupancies with an occupant load of 50 or more shall have a storm shelter constructed in accordance with ICC 500.

Exceptions:

1. Group E day care facilities that do not function as a school in which attendance by children is required by state law.
2. Group E occupancies accessory to places of religious worship.
3. Buildings meeting the requirements for shelter design in ICC 500.

Reason:

The purpose of the exception is to allow construction of a “day care” without a storm shelter. Day cares provide care to pre-school age children while parents are working and often provide care for Elementary or Middle School students before or after regular school hours. The intent of this exception is to not require tornado shelters for the children that are not required by state law to attend a public school or an equivalent education program. State Laws in all 50 States require attendance by children at a public school or equivalent educational program. Where children are in a day care at the choice of their parents or guardians, the parents or guardians have direct control over whether or not it is acceptable for their children to be in a facility without a tornado shelter.

However, because the IBC does not establish a maximum age limit on day care students, one could misinterpret the language in the 2018 IBC to allow considering an Elementary school as a day care so as to avoid requiring a tornado shelter.

Substantiation to support proposed change:

The following is Section 305 of the 2018 IBC. Section 305.2 does not establish a maximum age limit on day care students.

“SECTION 305

EDUCATIONAL GROUP E

305.1 Educational Group E.

Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

305.1.1 Accessory to places of religious worship.

Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 and have occupant loads of less than 100 per room or space, shall be classified as Group A-3 occupancies.

Section 305.2 Group E, day care facilities.

This group includes buildings and structures or portions thereof occupied by more than five children older than 2 ½ years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

305.2.1 Within places of religious worship.

Rooms and spaces within places of religious worship providing such day care during religious functions shall be classified as part of the primary occupancy.

305.2.2 Five or fewer children.

A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

305.2.3 Five or fewer children in a dwelling unit.

A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.”

Also, attached is a report on Compulsory School Age Requirements by the Education Commission of the States, which shows that all 50 States have minimum mandatory ages, which vary from State to State, generally from 5 to 8 years old but more commonly either 6 or 7 years old. This information was obtained for free online at

<http://www.ncsl.org/documents/educ/ECSCompulsoryAge.pdf> This link was established January 8, 2018

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal clarifies original code intent.

Internal ID: 2167

G62-18

IBC: 423.4

Proponent: Benchmark Harris, representing Self (bharris@huckabee-inc.com)

2018 International Building Code

Revise as follows:

423.4 Group E occupancies. In areas where the shelter design wind speed for tornados is 250 mph in accordance with Figure 304.2(1) of ICC 500, all Group E occupancies with an occupant load of 50 or more shall have a storm shelter constructed in accordance with ICC 500.

Exceptions:

1. Group E day care facilities.
2. ~~Group E occupancies~~ Religious educational rooms and religious auditoriums, which are accessory to places of religious worship.
3. Buildings meeting the requirements for shelter design in ICC 500.

Reason:

The phrase “religious educational rooms and religious auditoriums, which are accessory to places of religious worship” the appropriate phrase to identify building areas with a primarily religious function which should not be required to have shelters. The original language, on the other hand, could be incorrectly interpreted to waive the requirements for shelters in any private school as long as they simply have a religious affiliation. This incorrect interpretation would be discriminatory as it would not permit a waiver for private schools that do not have a religious affiliation.

Substantiation to support proposed change:

The following is Section 305 of the 2018 IBC. Section 305.1.1 uses the phrase “religious educational rooms and religious auditoriums, which are accessory to places of religious worship” (similar to the language used in Section 303.1.4).

“SECTION 305

EDUCATIONAL GROUP E

305.1 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

305.1.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 and have occupant loads of less than 100 per room or space, shall be classified as Group A-3 occupancies.

Section 305.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 2 ½ years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

305.2.1 Within places of religious worship. Rooms and spaces within places of religious worship providing such day care during religious functions shall be classified as part of the primary occupancy.

305.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

305.2.3 Five or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.”

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is simply clarifying the original code intent.

Internal ID: 2212

G63-18

IBC: 423.4.1

Proponent: Daniel Dain, representing Self (daniel.dain@stantec.com)

2018 International Building Code

Revise as follows:

423.4.1 Required occupant capacity. The required occupant capacity of the storm shelter shall include all of the ~~buildings~~ Group E occupancies on the site and shall be the greater of the following:

1. The total occupant ~~load~~ capacity of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The occupant ~~load~~ capacity of any indoor assembly space that is associated with the Group E occupancy.

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the code official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing storm shelters on the site.

Reason:

Below is the explanation for what IBC says regarding determining the **“Occupant Capacity”** for storm shelter. The suggestion would be to define this and use in lieu of “Occupant Load” because AHJ’s are having trouble distinguishing the difference. Code and fire officials are hung up on Chapter 10 Egress “occupant load” calculations for determining required shelter capacity.

2015 IBC

2015 IBC requires a storm shelter for E occupancies per Section 423. The section does not indicate or reference how to determine the occupant load. It does not reference anything in regards to egress, i.e. Chapter 10 or table 1004. Identifying the number of building occupants on a typical average school day has nothing to do with egress, it's not about fire exiting. It's about how much sf do we need to fit the building occupants. Section 1004.1 Design Occupant Load states “In determining means of egress requirements, the number of occupants for whom means of egress facilities are provided shall be determined in accordance with this section.”

The commentary in Section 423 states “Once the number of occupants to be accommodated is decided, ICC 500 provides details for the design and construction of the shelter”. It continues to state “It is not the intent to require the shelter to be designed for the total occupant load of the building that is used for means of egress. Where there is a situation where the classrooms would be empty if the gymnasium was full, such as an all-school assembly, or after-hours sporting event, the storm shelter can be designed to accommodate that occupant load.”

You will not find any reference in IBC 423, ICC 500, or FEMA P-361 to Chapter 10 of the IBC, it does not exist, that was never the intent. Keep in mind up until the 2015 IBC storm shelters were not required by occupancy type. If we designed a storm shelter at a rec center we would work with the owner to determine an appropriate capacity. For example, we may only have 5,000sf of usable space at $5/sf = 1,000$ occupants.

2018 IBC

Refer to text of EB 68-15, Dave Bowman ICC email, and 2015 IBC Storm Shelters AMENDED (which was issued by City of McKinney, TX).

The explanation of the ADDED Provisions states “Worse case occupant load is used for all spaces for fire exiting, but total occupant load for the building is excessive for storm shelter design. The determination for the required capacity of the shelter is based on the number of staff and students that will be in the school during a typical school day or any indoor assembly space that would be fully utilized outside school hours, whichever is greater. Thus, rather than the total occupant load of the building, the capacity of the shelter is appropriately based on occupant load described in the two scenarios described in Item 1 and 2.”

School districts may rely on enrollment data, fore Texas TEA capacity limits, and any other data or documentation they determine to identify the number of staff and students that will be in the school during a typical school day.

423.4.1 Required occupant capacity. The required occupant capacity of the storm shelter shall include all the buildings on the site, and shall be the greater of the following:

1. The total occupant load of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The occupant load of any indoor assembly space that is associated with the Group E occupancy.

ICC 500

Chapter 5 of the ICC 500 requires 5 sf per person. A 35% reduction on top of that is significant to consider furniture, walls, etc and our calculation still gives us more sf than we need (xx sf required vs xx sf usable). Reversing the calculation we have enough sf after the reductions to hold xx people (divide usable sf by 5). Keep in mind they will put as many people as they can safely fit and the requirement is only for 2 hours. The redundancy and worst case is built into the calculations.

ICC 500 should be updated also:

202 Definitions

Storm Shelter Occupant Load Capacity. The occupant load capacity intended for a room or space when that space is in use as a storm shelter.

[https://www.dropbox.com/scl/fo/35k4h0ub1654e3oeq8x61/AAAVLyk4PiU0DBo7qxP0ch8ca?](https://www.dropbox.com/scl/fo/35k4h0ub1654e3oeq8x61/AAAVLyk4PiU0DBo7qxP0ch8ca?dl=0&oref=e&r=AAmvqDhg6vcJDcl69Qfy36u-1vU-Z8CArzb_b_fyfwMcCMrbW8uKG4QhxkkMltn9aiOhtf4DptukbvurSm-WwOYjkE6PKtAZO1VwTwO7KfSKMte8N2T7GvbL95D1NW2p7JrqMqf8YeirjZmbx3fj_zsMSP75ugwL5RZLB6VTUWkUtL2IQqKFEpgHKAuE&sm=1)

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Link established 2.19.18

Cost Impact

The code change proposal will decrease the cost of construction .

The intent of this language is to clarify the commentary from the 2018 code proposed language that the intent when determining the occupant "capacity" of the storm shelter is not to use the building occupant "load" used for egress, which would result in shelters being over sized and higher construction costs.

Internal ID: 446

G64-18

IBC: 423.4.1

Proponent: Benchmark Harris, representing National Storm Shelter Association (bharris@huckabee-inc.com)

2018 International Building Code

Revise as follows:

423.4.1 Required occupant capacity. The required occupant capacity of the storm shelter shall include all of the buildings on the site and shall be the ~~greater of the following:~~

1. The total occupant load of the classrooms, vocational rooms and offices in the Group E occupancy.
2. ~~The occupant load of any indoor assembly space that is associated with the Group E occupancy.~~

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the code official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing storm shelters on the site.

Reason:

During normal daily use, there should not be more than the regular population of the school. If there is an assembly with more people than are regularly in the school, then adults have chosen to create that event and those adults have the ability to gauge the safety of venturing out and assembling. It should not be necessary to size the tornado shelter for indoor assembly events.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposed code change simply clarifies the intent of the original code language.

Internal ID: 2124

G65-18

IBC: 423.4.1

Proponent: Benchmark Harris, representing self (bharris@huckabee-inc.com)

2018 International Building Code

Revise as follows:

423.4.1 Required occupant capacity. The required occupant capacity of the storm shelter shall include all of the buildings on the site and shall be the greater of the following:

1. The total occupant load of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The occupant load of ~~any~~ the largest indoor assembly space that is associated with the Group E occupancy.

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the code official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing storm shelters on the site.

Reason:

The original language could be misinterpreted to indicate that item 2 of 423.4.1 refers to the occupant load of the sum of any indoor assembly spaces, whereas this provision should only require shelters accommodate the largest indoor assembly space because it is extremely unlikely that all indoor assembly spaces would be occupied to the maximum permitted fire egress limit and a significant tornado would strike the building.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal simply clarifies the code intent.

Internal ID: 2255

G66-18

IBC: 402.6.3, 424.1, 424.2, 424.3, 424.4, 424.5, 424.5.1 (New), [F] TABLE 903.2.11.6 IFC TABLE 903.2.11.6

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Revise as follows:

402.6.3 Children's play-Play structures. ~~Children's play-Play~~ structures located within the ~~mall~~ of a ~~covered mall~~ building or within the perimeter line of an *open mall building* shall comply with Section 424. The horizontal separation between ~~children's play~~ structures, kiosks and similar structures within the *mall* shall be not less than 20 feet (6096 mm).

SECTION 424 CHILDREN'S PLAY STRUCTURES

424.1 General. ~~Children's play-Play~~ structures installed inside all occupancies covered by this code that exceed 10 feet (3048 mm) in height or 150 square feet (14 m²) in area shall comply with Sections 424.2 through 424.5.

424.2 Materials. ~~Children's play-Play~~ structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. *Fire-retardant-treated* wood complying with Section 2303.2.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source.
4. Aluminum composite material (ACM) meeting the requirements of Class A *interior finish* in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the fire propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/ m² when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the fire propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701.
9. The floor covering placed under the children's play structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with ASTM E648 or NFPA 253.
10. Interior finishes for structures exceeding 300 square feet (28 m²) in area or 10 feet (3048 mm) in height shall have a flame spread index not greater than that specified in Table 803.13 for the occupancy group and location designated. Interior wall and ceiling finish materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.1.1, shall be permitted to be used where a Class A classification in accordance with ASTM E84 or UL 723 is required.

[F] 424.3 Fire protection. ~~Children's play-Play~~ structures shall be provided with the same level of *approved* fire suppression and detection devices required for other structures in the same occupancy.

424.4 Separation. ~~Children's play-Play~~ structures shall have a horizontal separation from building walls, partitions and from elements of the *means of egress* of not less than 5 feet (1524 mm). Children's playground structures shall have a horizontal separation from other children's play structures of not less than 20 feet (6090 mm).

424.5 Area limits. ~~Children's play~~ Play structures shall be not greater than 300 square feet (28 m²) in area, unless a special investigation, acceptable to the building official, has demonstrated adequate fire safety.

Add new text as follows:

424.5.1 Design. Play structures exceeding 300 square feet (28 m²) in area or 10 feet (3048 mm) in height shall be designed in accordance with Section 1601.1.

Revise as follows:

**[F] TABLE 903.2.11.6
ADDITIONAL REQUIRED SUPPRESSION 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
407.6	Group I-2
410.7	Stages
411.4	Special amusement buildings
412.3.6	Airport traffic control towers
412.4.6, 412.4.6.1, 412.6.5	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
419.5	<i>Live/work units</i>
424.3	Children's Play structures
427	Buildings containing laboratory suites
507	Unlimited area buildings
509.4	Incidental uses
1029.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the International Fire Code

Reason:

Indoor play structures can cover a wide range of activities and are not limited to children’s play structures. Some examples of these are; indoor skydiving, permanent haunted houses, very large and tall rock climbing walls in gymnasiums of schools and universities, laser tag facilities with elevated and large structures having massive concealed spaces, Indoor archery ranges with foam 3d targets and any number of other indoor activities with recreational structures located within a building. A growing number of “I” Occupancy structures are now adding adult playgrounds. A climbing or skydiving facility may be well over 1000 sf in area/footprint and I have recently reviewed one over 42’ in height. The structure in many cases needs to be designed per IBC Chapter 16 and ASCE 7, in a seismic zone it may be considered a “nonbuilding structure or attachment” with special design considerations needed. There are often unique structural stability and anchorage requirements, plus many potential fire safety issues dealing with concealed spaces and flame spread requirements. I think this change will not clutter the section nor create confusion as 424.1 already calls out “Children’s Play Structures installed inside all occupancies. I have not altered the term “Children’s” in section 424.4 as I believe that is a very unique requirement applicable to children’s playground equipment and would not apply to other larger play structures where they meet the design and FLS requirements for finishes and fire protection by submitting a special Investigation to the building Official as noted in section 424.5.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal is primarily a revision that clarifies that play structures are not necessarily just used by children. The requirements apply regardless of this designation. I one were to interpret the code as meaning that this is an expansion of requirements, then this could be taken to be that the cost of construction is increased. Since the requirements for larger play structures is expanded somewhat, the cost of construction may increase.

G67-18

IBC: [F] 424.3

Proponent: Jeffrey Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

[F] 424.3 Fire protection. Children's play structures shall be provided with ~~the same level of approved fire suppression and detection devices~~ fire protection systems required for other structures in the same occupancy.

Reason:

The term suppression is used in several ways throughout the IFC. Suppression is not a defined term, but it means to extinguish the fire or is commonly used as a fire department response term. The IFC uses suppression in ways that are not related to fire extinguishment or fire department response. This proposal adjusts lists, and charging sections to hone in to the intent of the section and replaces with a more exclusive and defined term of fire protection system. A fire protection system is a sprinkler system, an alarm system, a standpipe system and on and on. It is a better term. This proposal is consistent with an FCAC proposal that revises this terminology throughout the IFC and IBC in Chapter 9 and other locations.

Cost Impact

The code change proposal will decrease the cost of construction .

Using defined terms in the code will save on mis-interpretation and mis-application of the code.

Internal ID: 1863

G68-18

IBC: 424.5

Proponent: Marcelo Hirschler, GBH International, representing GBH International (gbhint@aol.com)

2018 International Building Code

Revise as follows:

424.5 Area limits. Children's play structures complying with Section 424.2 shall be not greater than ~~300~~600 square feet (~~28~~56 m²) in area, unless a special investigation, acceptable to the building official, has demonstrated adequate fire safety.

Reason:

The requirements contained in sections 424.2 are sufficiently adequate for fire safety that it is unnecessary to limit the area to which they apply simply to the range of 150 square feet up to 300 square feet. Note that, also, there is a requirement, in 424.3, for including active fire protection in the compartment where the structure is installed (not in the children's play structure itself).

Cost Impact

The code change proposal will decrease the cost of construction .

This code proposal will make it unnecessary to conduct a fire hazard assessment for children play structures that are between 300 and 600 square feet in area, if they meet the requirements of 424.2.

Internal ID: 1028

G69-18

IBC: [F]426.1

Proponent: Ellie Klausbruckner, Klausbruckner & Associates Inc., representing Klausbruckner & Associates, Inc. (ek@klausbruckner.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

[F] 426.1 General. The provisions of Sections 426.1.1 through 426.1.7 shall apply to buildings in which materials that produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with the applicable provisions of the International Fire Code. Where required by the fire code official, NFPA 652 and the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664 ~~and the International Fire Code shall apply.~~

Reason:

A complete revision of Chapter 22 of the IFC has been proposed. The chapter is intended to address many of the issues that concern fire departments (sources of ignition, duct collection, housekeeping, etc). NFPA 652 is a very useful standard and has been referenced in the new chapter should the fire code official require additional analysis. However it is no longer the only option for compliance. Therefore the language is revised to allow for the fire code official to require this analysis for more complicated uses and facilities, without the need to require it for every single facility that has or produces combustible dust.

Cost Impact

The code change proposal will decrease the cost of construction .

The proposed code change will decrease the cost for complicated analysis during plan submittals and inspections phase of a construction project.

Internal ID: 1618

G70-18

IBC: [F]426.1, [F]426.1.1, [F]426.1.2, [F]426.1.3, [F]426.1.4, [F]426.1.5, [F]426.1.6, [F]426.1.7

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

SECTION [F] 426 COMBUSTIBLE DUSTS, COMBUSTIBLE FIBERS, GRAIN PROCESSING AND STORAGE

Revise as follows:

[F] 426.1 General. ~~The provisions of Sections 426.1.1 through 426.1.7 shall apply to buildings in which materials that produce combustible dusts are stored or handled.~~ Buildings that store or handle combustible dusts or combustible fibers shall comply with NFPA 652 and the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664 and the International Fire Code. The provisions of Sections 426.2 through 426.8 shall apply as appropriate to buildings in which materials that produce combustible dusts are stored or handled.

[F] 426.1.1-426.2 Type of construction and height exceptions. Buildings shall be constructed in compliance with the height, number of stories and area limitations specified in Sections 504 and 506; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum building height shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum building height of Type IV structures shall be increased to 85 feet (25 908 mm).

[F] 426.1.2-426.3 Grinding rooms. Every room or space occupied for grinding or other operations that produce combustible dusts in such a manner that the ~~room or space is classified as a Group H-2 occupancy concentration and conditions create a fire or explosion hazard based a dust hazard analysis prepared in accordance with Section 426.1 and NEPA 652~~ shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating of the enclosure shall be not less than 2 hours where the area is not more than 3,000 square feet (279 m²), and not less than 4 hours where the area is greater than 3,000 square feet (279 m²).

[F] 426.1.3-426.4 Conveyors. Conveyors, chutes, piping and similar equipment passing through the enclosures of rooms or spaces shall be constructed dirt tight and vapor tight, and be of *approved* noncombustible materials complying with Chapter 30.

[F] 426.1.4-426.5 Explosion control. Explosion control shall be provided as specified in the International Fire Code, ~~or spaces shall be equipped with the equivalent mechanical ventilation complying with the International Mechanical Code.~~

[F] 426.1.5-426.6 Grain elevators. Separation distance. Grain elevators, malt houses and buildings for ~~similar occupancies other operations that produce combustible dusts in such a manner that the concentration and conditions create a fire or explosion hazard based on a dust hazard analysis prepared in accordance with Section 426.1 and NFPA 652~~ shall not be located within 30 feet (9144 mm) of interior *lot lines* or structures on the same *lot*, except where erected along a railroad right-of-way.

[F] 426.1.6-426.7 Coal pockets. Coal pockets located less than 30 feet (9144 mm) from interior lot lines or from structures on the same lot shall be constructed of not less than Type IB construction. Where more than 30 feet (9144 mm) from interior *lot lines*, or where erected along a railroad right-of-way, the minimum type of construction of such structures not more than 65 feet (19 812 mm) in *building height* shall be Type IV.

[F] 426.1.7-426.8 Tire rebuilding. Buffing operations shall be located in a room separated from the remainder of the building housing the tire rebuilding or tire recapping operation by a 1-hour *fire barrier*.

Exception: Buffing operations are not required to be separated where all of the following conditions are met:

1. Buffing operations are equipped with an *approved* continuous automatic water-spray system directed at the point of cutting action.
2. Buffing machines are connected to particle-collecting systems providing a minimum air movement of 1,500 cubic feet per minute (cfm) (0.71 m³/s) in volume and 4,500 feet per minute

(fpm) (23 m/s) in-line velocity.

3. The collecting system shall discharge the rubber particles to an *approved* outdoor noncombustible or fire-resistant container, which is emptied at frequent intervals to prevent overflow.

Reason:

This proposal is follow up work correlating the IBC and IFC provisions with the work done on Chapter 22 Combustible Dust and Chapter 37 Combustible Fibers in the IFC along with Section 426 of the IBC. Last cycle IBC Section 426 and IFC Chapter 22 were updated to incorporate NFPA 652 Standard on the Fundamentals of Combustible Dust.

An editorial change has been made with the numbering of the subsections. They are not a running subsection to 426.1, each covers a topic that an occupancy with a combustible dust hazard might have to comply with. The numbering scheme is a holdover from when the requirements were buried within another portion of the code.

The section title is modified to add "Combustible Fibers". A key hazard of combustible fibers can be combustible dust. The addition will highlight the need to apply this section to designers and code officials.

Section 426.1 is modified by switching the order of the sentences and adding "combustible fibers". This is to ensure this section and the dust hazard analysis in NFPA 652 is applied across the board to combustible dust and combustible fiber occupancies.

Section 426.1.2 (New 426.3) is modified to replace the Group H-2 trigger with one that refers to conditions that create a fire or explosion hazard based upon a dust hazard analysis.

Section 426.1.4 (New 426.5) is modified by eliminating the explosion control alternative reference to the IMC. Ventilation can be a form of explosion control, but the correct path is through Section 911 of the IFC and its referenced standard NFPA 69.

Section 426.1.5 (New 426.6) has been re-titled to "Separation distance" to correctly identify the subject matter and in place of similar occupancies which is subjective the wording "other operations that produce combustible dusts in such a manner that the concentration and conditions create a fire or explosion hazard based on a Dust Hazard Analysis prepared in accordance with Section 426.1 and NFPA 652" has been inserted.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The intent of these changes is not to change the cost of construction, simply to clean up and correlate language to other changes in the codes. Any time correlation is improved the cost of construction can be reduced.

Internal ID: 1619

G71-18 Part I

Part I: IBC: 202 (New), 802.8 (New), 429 (New), 429.1 (New), 429.2 (New), 429.3 (New), 429.4 (New), 429.5 (New), 429.6 (New), 429.7 (New), 429.8 (New); IFC: 202 (New), 801.2 (New), 802.1

Part II: IFC: 202 (New), 801.2 (New), 802.1

Proponent: Homer Maiel, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE GENERAL CODE DEVELOPMENT COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

INDOOR HORTICULTURAL GROW STRUCTURE. An enclosed structure installed within buildings that creates a controlled environment for enhanced horticultural growing conditions utilizing an artificial light source.

Add new text as follows:

429 INDOOR HORTICULTURAL GROW STRUCTURES

429.1 General. Indoor horticultural grow structures installed and operated inside all occupancies covered by this code that exceed 5 feet (1524mm) in height and 32 square feet (3.0 m²) in floor area shall comply with Sections 429.2 through 429.8.

429.2 Materials.

Horticultural grow structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Textiles and films complying with Test Method 2 of NFPA 701.
2. Foam plastics having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source.
3. Solid plastic materials used to construct rigid components exhibiting a peak rate of heat release not exceeding 400 kW/ m² when tested in accordance with ASTM E1354 at an incident heat flux, of 50 kW/m²; in the horizontal orientation at a thickness of 6 mm.
4. Fire-retardant-treated wood complying with Section 2303.2.
5. Light-transmitting plastics complying with Section 2606.
6. Aluminum composite material (ACM) meeting the requirements meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.

429.3 Electrical wiring and equipment. Electrical wiring, luminaires and equipment shall be listed and labeled for the intended use and installed in accordance with the manufacturer's instructions and NFPA 70.

429.4 Carbon dioxide enrichment systems. Where provided, carbon dioxide enrichment systems shall comply with Section 5307.4 of the International Fire Code.

429.5 Heating appliances. Where heating appliances are installed, these devices shall be installed in accordance with the manufacturer's instructions and the requirements found in Chapter 9 of the International Mechanical Code.

429.6 Fire protection systems. All required fire protection systems shall be in accordance with section 901.2 of this Code. Clearance shall be maintained between automatic sprinklers and the top of horticultural grow structures in accordance with NFPA 13.

429.7 Clearance from ignition sources. Clearance between indoor horticultural grow structures and ignition sources such as luminaires, heaters and grow lamps shall be maintained in an approved manner.

429.8 Area limits. Indoor horticultural grow structures shall not exceed an aggregate 200 square feet (18.6 m²) of floor area per fire area, unless a special investigation, acceptable to the code official, has demonstrated adequate fire safety.

802.8 Indoor horticultural grow structures. The materials used to construct indoor horticultural grow structures shall comply with Section 429.

Internal ID: 1053

G71-18 Part II

IFC: SECTION 202, 202 (New), 801.2 (New), 802.1

Proponent: Homer Maiel, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2018 International Fire Code

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows:

INDOOR HORTICULTURAL GROW STRUCTURE An enclosed structure installed within buildings that creates a controlled environment for enhanced horticultural growing conditions utilizing an artificial light source.

Add new text as follows:

801.2 Indoor horticultural grow structures. The materials used to construct horticultural grow structures in new and existing buildings shall comply with Section 429 of the International Building Code.

802.1 Definitions. INDOOR HORTICULTURAL GROW STRUCTURE.

Reason:

The definition of an Indoor Horticultural Grow Structure includes the use of an artificial light source to help differentiate it from a greenhouse operation which utilizes a sunlit environment.

Horticultural grow structures constructed of combustible materials are increasingly being used indoors in commercial and residential occupancies, and sizes vary from 2 ft. by 2 ft. to over 10 ft. by 20 ft. Examples of these products and related accessories can be found at:

[https://www.amazon.com/s/ref=sr_st_price-desc-rank?](https://www.amazon.com/s/ref=sr_st_price-desc-rank?keywords=Indoor+Grow+Tents&rh=i%3Aaps%2Ck%3AIndoor+Grow+Tents&qid=1514996452&sort=price-desc-rank)

[keywords=Indoor+Grow+Tents&rh=i%3Aaps%2Ck%3AIndoor+Grow+Tents&qid=1514996452&sort=price-desc-rank](https://www.amazon.com/s/ref=sr_st_price-desc-rank?keywords=Indoor+Grow+Tents&rh=i%3Aaps%2Ck%3AIndoor+Grow+Tents&qid=1514996452&sort=price-desc-rank)

There are several safety concerns that need to be addressed to ensure adequate safety is provided, which are addressed in the proposal and described as follows. The proposed requirements are similar to those included in IBC Section 424 for indoor children's play structures. Specific comments on the proposal include the following:

IFC Section 801.2 - The reference to IBC Section 429 is provided as a convenience to the user, and to clarify that the requirements apply to installations in new and existing buildings.

IBC Section 802.7 - This reference is provided for users who are looking for fabric and material flammability requirements for these structures.

Section 429.1 - Threshold size limitations are proposed to exclude smaller horticultural grow structures that represent less of a fire hazard compared to larger structures.

Section 429.2 - Requirements are similar to those in Section 424.2.

Section 429.4 - Carbon dioxide enrichment systems are sometimes sold as accessories for horticultural grow structures. A reference is provided to the IFC requirements covering these systems as a convenience to the code user.

Section 429.8 - The area limit concept is similar to that in Section 424, and allows the code official to address fire hazards with larger areas without having to invoke imminent hazard or hazard abatement requirements in the code.

Cost Impact

The code change proposal will increase the cost of construction .

This action will increase the cost of construction. There may be an additional cost of materials used to comply with Section 429.2, and to comply with the additional safety requirements.

Internal ID: 3509

G72-18

IBC: 202, 308.1.1(New), 429 (New), Chapter 35

Proponent: Dave Frable, U.S. General Services Administration, representing U.S. General Services Administration

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

LOCK-UP An area located within a building or structure having a predominant occupancy classification other than Group I-3, and where the occupants for penal or correctional purposes are detained for less than 24 hours by the use of security measures not under the occupants' control.

Add new text as follows:

308.1.1 Lock-ups. Lock-ups located within a building or structure having a predominant occupancy classification other than Group I-3, where the area has capacity for not more than 50 detainees, and where no individual is detained for 24 hours or more, shall comply with the requirements of the predominant occupancy of the building or structure in which the lock-up is located and with the requirements of Section 429. Lock-ups having a capacity for more than 50 detainees or where any individual is detained for 24 hours or more shall be classified as Group I-3 occupancy and shall comply with the other applicable requirements in this code.

429 LOCK-UPS

429.1 General. Lock-ups located within a building or structure having a predominant occupancy classification other than Group I-3, where the area has capacity for not more than 50 detainees, and where no individual is detained for 24 hours or more, shall comply with the provisions in Sections 429.1 through 429.5 and other applicable provisions of this code.

429.2 Automatic Sprinkler System. Buildings and structures where lock-ups are located shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

429.3 Fire Alarm System. Buildings and structures where lock-ups are located shall be equipped with a fire alarm system that initiates the occupant notification signal installed in accordance with Section 907.6.

429.4 Lock-up Criteria. The lock-up shall comply with the requirements for the predominant occupancy of the building in which the lockup is located, and the following criteria:

1. Doors and other physical restraints to free egress by detainees can be readily released by staff within 2-minutes of the onset of a fire or similar emergency.
2. Staff is in sufficient proximity to the lock-up so as to be able to cause the 2-minute release required by Item1 whenever detainees occupy the lockup.

Exception:Where staff is not in sufficient proximity to the lock-up so as to be able to cause the 2-minute release required by Item 2, an automatic smoke detection system shall be installed throughout the lock-up area installed in accordance with the requirements in NFPA 72.
3. Staff is authorized to cause the release required by Item 1.
4. Staff is trained and practiced in effecting the release required by Item1.
5. Where the release required by Item1 is caused by means of remote release, detainees are not to be restrained from evacuating without the assistance of others.
6. Where security operations necessitate the locking of required means of egress, the following shall apply:
 - 6.1. Detention-grade hardware complying with ASTM F 1577 shall be provided on swinging doors within the required means of egress.
 - 6.2. Sliding doors within the required means of egress shall be designed and engineered for detention and correctional use, and lock cylinders shall meet the cylinder test requirements of ASTM F 1577.

429.5 Fire department notification. The building owner/manager shall notify the fire department with responsibility to respond to the building or structure of the presence of the lockup.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA 19428-
2959
US

F1577-05 (2012):

Standard Test Methods for Detention locks for Swinging Doors

Analysis: A review of the standard proposed for inclusion in the code, [INSERT STANDARD], with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Reason:

The intent of this code change proposal is to address the subject matter of ‘lock-ups” where the occupants for penal or correctional purposes are detained for less than 24 hours by the use of security measures not under the occupants’ control. A lock-up is basically a holding area in which persons are detained with some degree of security imposed on them that are commonly located in different types of occupancies. For example, lockups are typically located in U.S. Customs and Border Protection facilities at border crossings, airports and seaports; prisoner holding facilities at courthouses; local police departments; security offices at sports stadia; security offices at shopping mall complexes; etc. Currently, the requirements within the IBC require “lock-ups” to meet the rigorous defend in place requirements applicable to Institutional Group I-3 occupancies. This code change proposal provides requirements specifically for lock-ups located in building and structures having a predominant occupancy classification other than Institutional Group I-3 occupancy and provides a reasonable set of safe guards applicable to the predominant occupancy of the building in which the lock-up is located. The subject provisions for lock-ups are meant to apply to holding areas having a capacity of not more than 50 detainees, in which no individual is detained for 24 hours or more. The threshold for the holding area to limit the capacity to not more than 50 detainees is based on the requirements in NFPA 101, Life Safety Code, and seems reasonable for processing/holding areas for facilities at border crossings, airports and seaports and prisoner holding facilities at courthouses.

Section 202 has been revised to include a new definition for a lock-up. Section 308 has also been revised to include a new sub-section 308.1 on lock-ups

A new Section 429, Lock-Ups has been created to provide a reasonable set of safe guards applicable for when a predominant occupancy of the building or structure has an occupancy classification other than Institutional Group I-3 occupancy in which the lock-up is located. For example, safe guards include, but are not limited to: an automatic sprinkler system throughout the building or structure, a fire alarm system, a 2-minute timeframe for trained staff to release the detainees or an option for the installation of a smoke detection system within the lock-up area if the 2-minute timeframe for trained staff to release the detainees cannot be met, detention-grade door hardware to improve reliability, and building owner/manager notification of the local responding fire department of the presence of the lock-up.

Please note that the subject code change proposal is based on the requirements for lock-ups in the National Fire Protection Association 101, Life Safety Code (2018 edition).

The intent of this proposal is to reference ASTM Standard F 1577-05 (2012), Standard Test Methods for Detention Locks for Swinging Doors to improve the reliability of detention-grade hardware for lock-ups.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

We believe the subject code change proposal to include lock-ups will not affect the cost of construction either way.

Requiring lock cylinders of detention door hardware to meet the cylinder test requirements of ASTM F 1577 may increase construction costs.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F1577-05 (2012), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

G73-18

IBC 503.1.4

Proponent: Lee Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows:

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the *building area* as regulated by Section 506.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification ~~in accordance with Section 907.5~~ where required by Section 907.2 is provided in the area of the occupied roof.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

503.1.4.1 Enclosures over occupied roof areas. Elements or structures enclosing the occupied roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupied roof.

Exception: Penthouses constructed in accordance with Section 1510.2 and towers, domes, spires and cupolas constructed in accordance with Section 1510.5.

Reason:

This code change is needed to clarify exactly what is required for exception #1 of Section 503.1.4 in terms of providing occupant notification in the area of the occupied roof. This is done by replacing the reference to 907.5 with 907.2 which provides scoping for fire alarms based on the occupancy served on the occupied roof. Section 907.5 is referenced from 907.2 so once the scope of the fire alarm system is determined in 907.2 designers will then go to 907.5 to determine installation requirements.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is simply a clarification of the requirements. There will be no cost impact.

Internal ID: 85

G74-18

IBC: 503.1.4.1

Proponent: Jay Hyde, representing Sacramento Valley Association of Building Officials
(jhyde@mogaveroarchitects.com)

2018 International Building Code

Revise as follows:

503.1.4.1 Enclosures surrounding occupied roof areas. Elements or structures enclosing occupied roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupied roof.

~~Exception~~**Exceptions:**

1. Penthouses constructed in accordance with Section 1510.2 and towers, domes, spires and cupolas constructed in accordance with Section 1510.5.
2. Exterior walls or fire walls of adjacent buildings in conformance with the following:
 - 2.1. The exterior sides of the occupied roof not surrounded by adjacent buildings, penthouses, towers, domes spires and cupolas shall have uniformly distributed parapets with a sill height not greater than 48 inches (1220 mm).
 - 2.2. The aggregate length of the parapets shall not be less than 40 percent of the total exterior wall.
 - 2.2.1. Parapets are not required to be distributed over 40 percent of the occupied roof perimeter where they are uniformly distributed over two opposing sides of the occupied roof.

Reason:

Buildings with occupied roofs may be located between two adjacent buildings restricting openness, access and ventilation. This proposal considers that the open side/ventilation requirements for open parking garages contained in IBC Section 406.5.2 will provide the necessary openness and ventilation for occupied roofs.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change proposal will not increase or decrease the cost of construction because this exception is permissive, not mandatory: it permits a designer to locate an occupied roof on a building which is not freestanding.

Internal ID: 1417

G75-18

IBC: TABLE 504.3

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

Revise as follows:

**TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE^a**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION											TYPE OF CONSTRUCTION	TYPE OF CONSTRUCTION
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A, B, E, F, M, S, U	NS ^b	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S	UL	180	85	75	85	75	<u>270</u>	<u>180</u>	<u>85</u>	85	70	60
H-1, H-2, H-3, H-5	NS ^{c, d}	UL	160	65	55	65	55	<u>120</u>	<u>90</u>	<u>65</u>	65	50	40
	S												
H-4	NS ^{c, d}	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S	UL	180	85	75	85	75	<u>140</u>	<u>100</u>	<u>85</u>	85	70	60
I-1 Condition 1, I-3	NS ^{d, e}	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S	UL	180	85	75	85	75	<u>180</u>	<u>120</u>	<u>85</u>	85	70	60
I-1 Condition 2, I-2	NS ^{d, e, f}	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S	UL	180	85									
I-4	NS ^{d, g}	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S	UL	180	85	75	85	75	<u>270</u>	<u>180</u>	<u>85</u>	85	70	60
R ^h	NS ^d	UL	160	65	55	65	55	<u>65</u>	<u>65</u>	<u>65</u>	65	50	40
	S13D	60	60	60	60	60	60	<u>60</u>	<u>60</u>	<u>60</u>	60	50	40
	S13R	60	60	60	60	60	60	<u>60</u>	<u>60</u>	<u>60</u>	60	60	60
	S	UL	180	85	75	85	75	<u>270</u>	<u>180</u>	<u>85</u>	85	70	60

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB and its various WGs held meetings, studied issues and sought input from various expert sources around the world. The TWB has posted those documents and input on its website for interested parties to follow its progress and to allow those parties to, in turn, provide input to the TWB.

At its first meeting, the TWB discussed a number of performance objectives to be met with the proposed criteria for tall wood buildings:

No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered.

No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios.

No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios.

No unusual fire department access issues.

Egress systems designed to protect building occupants during the design escape time, plus a factor of safety.

Highly reliable fire suppression systems to reduce the risk of failure during reasonably expected fire scenarios. The degree of reliability should be proportional to evacuation time (height) and the risk of collapse.

The comprehensive package of proposals from the TWB meet these performance objectives. The TWB also determined that fire testing was necessary to validate these concepts. At its first meeting, members discussed the nature and intention of fire testing so as to ensure meaningful results for the TWB and, more specifically, for the fire service. Subsequently a test plan was developed. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of joints, and to evaluate conditions for responding fire personnel. The Fire WG then refined the test plan, which was implemented with a series of five, full-scale, multiple-story building tests at the Alcohol, Tobacco and Firearms (ATF) laboratories in Beltsville, MD. The results of those tests, as well as testing conducted by others, helped form the basis upon which the Codes WG developed its code change proposals. This code change proposal is one of those developed by the Codes WG and approved by the TWB.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3-1/2 minutes each, please visit:

<http://bit.ly/ATF-firetestvideos>.

Both of these links were confirmed active on 12/27/17

Allowable Height

This proposal addresses the allowable building height, in terms of feet, for the three new construction types proposed by the TWB. As set forth in the proposal to Section 602.4, the three new types of construction are Types IV-A, IV-B, and IV-C. The Committee examined each proposed type of construction for its safety and efficacy with regard to each occupancy type.

The following approach was used to develop proposed allowable heights of the new construction types, based on the conclusions of the Committee:

Based upon TWB review of fire safety and structural integrity performance, Type IV-B is equated to Type I-B for height (in feet). A noteworthy item to remember is that, per Section 403.2.1.1 of the IBC, Type IB construction is permitted to be reduced to 1-hour Fire Resistance rating; however, the TWB does not propose to allow the same reduction for Type IV-B. As a result, the comparison is between 2-hr mass timber construction that is partially exposed, versus 1-hr Type IB construction, and the Committee believes that 2-hr mass timber construction that is partially exposed per the limits of proposed Section 602.4 warrants the same heights as allowed for 1-hr Type I-B construction. It should be noted that the unprotected mass timber also needs to meet the 2 hour FRR, thus the protected area will likely be conservatively higher FRR than actually required;

Type IV-A should be somewhat larger than IV-B, as Type IV-A construction is entirely protected (no exposed mass timber permitted) and the required rating of the structure is equivalent to those required of Type I-A construction (3-hr rating for structural frame). However, the Committee did not find it acceptable to allow the unlimited heights of Type I-A to be applied to Type IV-A. Instead, the Committee applied a multiplier of 1.5 to the heights proposed for Type IV-B construction, in order to propose reasonable height allowances for IV-A construction;

The Committee viewed Type IV-C as similar to existing HT construction with the exception that IV-C has a 2 hour FRR where HT is acceptably fire resistant based on the large sizes of the members. As such, the height in feet is proposed to be equal to the height in feet of Type IV-HT. In terms of stories, however, the Committee proposed an additional number of stories for IV-C in recognition of its greater FRR.

4. While the base code seems to allow significant heights for buildings without sprinklers (e.g., Table 504.3 currently allows a height of 160 feet for NS Type I-B construction for many occupancy classifications), the Committee believes that no additional heights over what is already permitted for Type IV-HT would be proposed for the NS (non sprinklered) rows. As such, where separate rows are provided for heights for the NS situation, the proposed heights for Types IV-A, IV-B, and IV-C are the same as those heights already permitted for Type IV for the NS condition.

This methodology explains the majority of the recommendations here. Specifically, for occupancy groups A, B, E, F, I-4, M, R, S, U, the methodology described above accurately reflects how the height proposals were developed.

After undergoing this methodology to develop initial height recommendations, the Committee then applied professional judgment (from both a fire safety and a structural perspective), to develop a working draft table, cell by cell, for all occupancy types.

The exercise for establishing the allowable number of stories for the three new types of construction started with setting Type I-B allowances equivalent to Type IV-B. The tabular fire resistance ratings of building elements for these two types of construction is identical (not including the reduction permitted by 403.2.1.1), so the identical number of stories was deemed a reasonable starting point. From this point, the TWB Committee reviewed each occupancy classification to see if the Type I-B story allowance required adjustment.

Following is a summary of how allowable number of stories for sprinklered I-B were adjusted for IV-B:

A-1, A-2, A-3, A-4, A-5, B, E, H-1, H-5, I-1(1), I-1(2), I-2, I-3, I-4, R-1, R-2, R-3, R-4, U: no adjustment, same number of allowable stories as Type I-B.

F-1 and S-1: reduced from 12 to 7 (2 story increase from Type IV-HT)

F-2, M, S-2: reduced from 12 to 8 (2 story increase from Type IV-HT)

H-2: reduced from 3 to 2 (same as Type IV-HT)

H-3: reduced from 6 to 4 (same as IV-Type HT)

H-4: reduced from 8 to 7 (1 story increase from Type IV-HT)

Similarly, to establish the height in feet for Type IV-B:

A-1, A-2, A-3, A-4, A-5, B, E, F-1, F-2, I-4, M, R-1, R-2, R-3, R-4, S-1, S-2, U: same allowable height as I-B.

H-1, H-2, H-3: reduced from 180' to 90'

H-4: reduced from 180' to 100'

H-5: reduced from 160' to 90'

I-1(1): reduced from 180' to 120'

I-1(2): reduced from 180' to 65'

I-2: reduced from 180' to 65'

I-3: reduced from 180' to 120'

Adjusting IV-B up to IV-A for allowable number of stories:

A-1, A-2, A-3, A-4, A-5, B, E, F-2, I-4, M, R-1, R-2, R-3, R-4, S-1, S-2, U - 1.5 x IV-B number of stories

F-1, S-1 increase by 3 stories

H-1, H-3 same as IV-HT

H-2, H-4, H-5 increase by 1 story

I-1(1), I-1(2), I-2, I-3 increase by 2 stories

H-3 reduced from 6 to 4 (same as IV-HT)

H-4 reduced from 8 to 7 (1 story increase from IV-HT)

I-1(1), I-1(2), I-2, I-3, same as IV-HT

Adjusting IV-B to IV-A for building height:

A-1, A-2, A-3, A-4, A-5, B, E, F-1, F-2, H-1, H-5, I-1(1), I-3, I-4, M, R-1, R-2, R-3, R-4, S-1, S-2, U: multiply 1.5 x Type IV-B (180 ft.)

H-1, H-2 H-3, H-5: increase by 30 ft.

H-4: increase by 40 ft.

I-1(2), I-2: same as Type IV-HT

For instance, for Groups H-1, H-2, H-3, and H-5, while the table allows 160 feet for Type I-B construction, the Committee proposed a height of 90 feet for Type IV-B construction, and is using a multiplier of 1.33 to propose a height for Type IV-A construction of 120 feet height, intentionally made equal to the existing Heavy Timber heights.

For H-4, corrosives represent a health hazard (but not necessarily a fire hazard) to building occupants and first responders, the Committee believed that reduced heights were warranted. These are slightly greater than discussed above for the H-occupancy groups (140 feet versus 120 feet for IV-A construction, and 100 feet versus 90 feet for IV-B construction), but these still are far below what is permitted for Type I-B construction (180 feet permitted for the sprinklered condition), and is in recognition of the particular type of Hazardous occupancy covered by the H-4 occupancy group.

For Group I occupancies, there are two rows in the table, one being a row that includes I-1 Condition 1 and I-3 occupants (more capable of self-preservation) and the other being a row that includes I-1 Condition 2 and I-2 occupants (less capable of self-preservation). For I-1 Condition 1 and I-3 occupants, the Committee proposed a height of 120 feet for Type IV-B (versus 180 feet from the general methodology summarized above) and a height of 180 feet for Type IV-A (versus 270 feet from the general methodology summarized above). For those I-1 Condition 2 and I-2 occupants, the Committee took a very conservative approach and will only allow the heights that are already permitted by code for traditional Type IV construction.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 844

G76-18

IBC: TABLE 504.3, TABLE 504.4

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); Jason Krohn, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

2018 International Building Code

Revise as follows:

**TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE^a**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS ^b	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
<u>B</u>	<u>NS</u>	<u>UL</u>	<u>160</u>	<u>80</u>	<u>55</u>	<u>65</u>	<u>55</u>	<u>65</u>	<u>50</u>	<u>40</u>
	<u>S</u>	<u>UL</u>	<u>180</u>	<u>100</u>	<u>75</u>	<u>85</u>	<u>75</u>	<u>85</u>	<u>70</u>	<u>60</u>
H-1, H-2, H-3, H-5	NS ^{c, d}	UL	160	65	55	65	55	65	50	40
	S									
H-4	NS ^{c, d}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 1, I-3	NS ^{d, e}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 2, I-2	NS ^{d, e, f}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85						
I-4	NS ^{d, g}	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
R ^h	NS ^d	UL	160	65 <u>80</u>	55	65	55	65	50	40
	S	UL	180	85 <u>100</u>	75	85	75	85	70	60

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

**TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANEa, b**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5 6	3	5	3	5	3	2
	S	UL	12	6 7	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
F-1	NS	UL	11	4	2	3	2	4	2	1
	S	UL	12	5	3	4	3	5	3	2
F-2	NS	UL	11	5	3	4	3	5	3	2
	S	UL	12	6	4	5	4	6	4	3
H-1	NS ^{c, d}	1	1	1	1	1	1	1	1	NP
	S									
H-2	NS ^{c, d}	UL	3	2	1	2	1	2	1	1
	S									
H-3	NS ^{c, d}	UL	6	4	2	4	2	4	2	1
	S									
H-4	NS ^{c, d}	UL	7	5	3	5	3	5	3	2
	S	UL	8	6	4	6	4	6	4	3
H-5	NS ^{c, d}	4	4	3	3	3	3	3	3	2
	S									
I-1 Condition 1	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5	4	5	4	5	4	3
I-1 Condition 2	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5						
I-2	NS ^{d, f}	UL	4	2	1	1	NP	1	1	NP
	S	UL	5	3						
I-3	NS ^{d, e}	UL	4	2	1	2	1	2	2	1
	S	UL	5	3	2	3	2	3	3	2
I-4	NS ^{d, g}	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2
R-1 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S	UL	12	5 6	5	5	5	5	4	3
R-2 ^h	NS ^d	UL	11	4	4	4	4	4	3	2

	S	UL	12	<u>5 6</u>	5	5	5	5	4	3
R-3 ^h	NS ^d	UL	11	4	4	4	4	4	3	3
	S	UL	12	<u>5 6</u>	5	5	5	5	4	4
R-4 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S	UL	12	<u>5 6</u>	5	5	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	3	1
	S	UL	12	5	3	4	3	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	2
	S	UL	12	6	4	5	4	5	5	3
U	NS	UL	5	4	2	3	2	4	2	1
	S	UL	6	5	3	4	3	5	3	2

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason:

Since development of the early building codes, and even with the International Building Code today, building size has typically been determined based on a combination of factors; (a) the occupancy type for the building; (b) the materials used to construct the building; and (c), the presence of automatic sprinkler protection. Regarding occupancy types, the fire loads associated with contents found in a particular occupancy group and the relative risk of danger to the occupants from fire because of the occupancy characteristics are considered. For the materials used to construct the building the presence of combustible materials used in the construction of the building structure itself are key. As the quantity of combustible materials decreases the relative risk of fire size, spread of fire to adjacent properties, and danger to the fire service are less such that the building sizes are allowed to increase. Another factor considered from a building materials aspect is the degree of fire resistance provided. When structural fire resistance is provided to the load carrying structural members the risk of damage to the structure or potential for collapse is also considered reduced. Finally, sprinkler protection has been utilized as a factor in allowing increases in the size of buildings. A good discussion of these concepts can be found in the report "Fire-Resistance Classifications of Building Construction", Report BMS92, National Bureau of Standards, October 7, 1942.

One thing of importance in the report is that buildings constructed of noncombustible materials and provided with at least 1-hour of fire resistance (classified as Fireproof construction in the report) were considered to be a much lower risk to the safety of the occupants and fire service, and to the spread of fire, than buildings constructed of noncombustible materials with little or no fire resistance (classified as Incombustible construction in the report). The same was said for buildings constructed with a combination of noncombustible exterior walls and interior combustible structural materials (classified as Exterior-Protected construction in the report). Hence the report advised that these noncombustible buildings with at least 1-hour fire resistance could be built to taller heights due to the lack of combustible materials in the structural systems combined with some level of fire resistance.

Unfortunately, when you look at Tables 504.3 and 504.4 in the 2018 International Building Code, building occupancies with low internal fire loads such as Group B, Business and Group R, Residential, when constructed of one-hour fire rated noncombustible construction (i.e. Type IIA), are not given due credit for the enhanced fire risk attributes when compared to buildings of one-hour fire resistance construction using a combination of noncombustible exterior walls and interior combustible structural materials (i.e. Types IIIA and Type IV). This is especially apparent when comparing these Group B and R occupancies to Group F, Factory and Group S, Storage Occupancies in Table 504.4.

Recognizing the lower fire risk of Type IIA construction compared to Type IIIA and Type IV construction, this code change proposes permitting Group B and Group R buildings of Type IIA construction to be built one story and 15-feet higher. These increases are attributed to elimination of the fire load present in the structural components, combined with the 1-hour fire resistance for these noncombustible structural elements, consistent with the fire safety premises for building construction types in BMS92. The new story heights are increased in proportion to the story heights/number of stories for existing buildings of Type IIA Group B and Group R, with rounding to be consistent with other values in Table 504.3.

Cost Impact

The code change proposal will decrease the cost of construction .

Presently Group B and R occupancy buildings of noncombustible construction with 1-hour fire resistance (i.e. Type IIA) are only allowed to be built to the same story height as buildings of Group B and R occupancy with a combination combustible/noncombustible construction and a 1-hour fire resistance (i.e. Type IIIA and IV). However, to build Group B or R occupancy buildings of noncombustible construction taller, the fire resistance of the structural elements (i.e. columns and floors) are required to be increased to 2-hours (i.e. Type IB construction).

This proposal recognizes the improved fire safety of Group B and R occupancy buildings of Type IIA construction, compared to Types IIIA and IV construction of the same occupancy groups, since Type IIA buildings have a reduced fire load associated with the reduced use of combustible structural components. Allowing one additional story height of Group B and R occupancy buildings without having to increase the fire resistance of columns and floors will reduce the cost of construction of these noncombustible buildings Group B and R occupancies.

Internal ID: 1541

G77-18

IBC: 504.4

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

504.4 Number of stories. The maximum number of *stories* above grade plane of a building shall not exceed the limits specified in Table 504.4.

Reason:

This very simple change matches the language of Section 504.4 to the language of Table 504.4. Absent this correction any “limit specified in the Table” could be misconstrued as the “number of stories of a building” by Section 504.4, and thereby include basement story(s).

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The change is a simple clarification of existing code requirements. No cost impact.

Internal ID: 1660

G78-18

IBC: TABLE 504.4

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

2018 International Building Code

Revise as follows:

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE^a PLANE^{a, b}

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
F-1	NS	UL	11	4	2	3	2	4	2	1
	S	UL	12	5	3	4	3	5	3	2
F-2	NS	UL	11	5	3	4	3	5	3	2
	S	UL	12	6	4	5	4	6	4	3
H-1	NS ^{c, d}	1	1	1	1	1	1	1	1	NP
	S									
H-2	NS ^{c, d}	UL	3	2	1	2	1	2	1	1
	S									
H-3	NS ^{c, d}	UL	6	4	2	4	2	4	2	1
	S									
H-4	NS ^{c, d}	UL	7	5	3	5	3	5	3	2
	S	UL	8	6	4	6	4	6	4	3
H-5	NS ^{c, d}	4	4	3	3	3	3	3	3	2
	S									
I-1 Condition 1	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5	4	5	4	5	4	3
I-1 Condition 2	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5						
I-2	NS ^{d, f}	UL	4	2	1	1	NP	1	1	NP
	S	UL	5	3						
I-3	NS ^{d, e}	UL	4	2	1	2	1	2	2	1
	S	UL	5	3	2	3	2	3	3	2
I-4	NS ^{d, g}	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2
R-1 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3

R-2 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S13R	4	4	4					4	3
	S	UL	12	5	5	5	5	5	4	3
R-3 ^h	NS ^d	UL	11	4	4	4	4	4	3	3
	S13D	4	4						3	3
	S13R	4	4						4	4
	S	UL	12	5	5	5	5	5	4	4
R-4 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S13D	4	4						3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	3	1
	S	UL	12	5	3 4	4	3	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	2
	S	UL	12	6	4	5	4	5	5	3
U	NS	UL	5	4	2	3	2	4	2	1
	S	UL	6	5	3	4	3	5	3	2

Footnotes of the table are unchanged.

Reason:

This code change proposal returns the maximum number of stories of sprinklered S-1 buildings to the 2006 IBC value of 4 stories. In 2009, the Code Technology Committee Balanced Fire Protection Features Study Group reduced the maximum number of stories permitted in some occupancies for unprotected construction (IIB & IIIB). The justification was that the I-Codes permitted only a single-story sprinkler height increase, so in order to match the permitted number of stories in the legacy codes for sprinklered buildings, unsprinklered buildings exceeded what was allowed. At the time, the study group chose not to propose modifying the sprinkler increase in the IBC. With the reformatting of the height-and-area provisions of the Code in 2015, we are now able to return to the 2006 maximum number of stories for a sprinklered building without affecting unsprinklered buildings.

This proposal seeks only to return to the 2006 story limit for sprinklered, S-1 noncombustible Type IIB buildings. These buildings were commonly constructed prior to the adoption by jurisdictions of the 2009 IBC, and we have seen no adverse effect on life safety or property protection.

Unsprinklered IBC Table 503 Values

Use Group	IBC	IBC
B	3	5
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
 Assembly: ASF AMF DF

G119-07/08

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

**TABLE 503
 ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade planes.
 Area limitations as determined by the definition of "Area, building," per story**

GROUP	HGT(feet)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HGT(S)	UL	160	65	55	65	55	65	50	40
S-1	S	UL	11	4	3-2	3	3-2	4	3	1
	A	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	8,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

**Type IIB, Type IIB (Unprotected Construction)
 Story Comparison (w/ NFPA 13 Sprinklers)**

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted
 * - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-

2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
 Assembly: ASF AMF DF

G120-07/08

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

**TABLE 503
 ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade plane.
 Area limitations as determined by the definition of "Area, building," per story**

GROUP	HGT(feet)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HGT(S)	UL	160	85	55	85	55	85	50	40
S-2 ^{a, c}	S	UL	11	5	4-3	4	4-3	5	4	2
	A	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

**Type IIB, Type IIB (Unprotected Construction)
 Story Comparison (w/ NFPA 13 Sprinklers)**

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted

* - Applies for R-1, R-2 and R-3 Use Groups

Cost Impact

The code change proposal will decrease the cost of construction .

For S-1 buildings, this code change proposal allows a 4-story building to be Type IIB instead of having to be IIA, thus reducing the cost of requiring fire-rated construction.

G79-18

IBC: 504.4

Proponent: Keith Flanders, Cosentini Associates, representing self (kflanders@cosentini.com)

2018 International Building Code

Revise as follows:

504.4 Number of stories. The maximum number of *stories* of a building shall not exceed the limits specified in Table 504.4. An occupied roof is considered a story above grade unless otherwise specified as a portion of the story below by the provisions of this code.

Reason:

There is often a debate when an occupied roof may exceed the prescribed number of stories above grade plane. Adding this language seeks to clarify that an occupied roof should be considered a story above grade when determining the allowable number of stories for a building based on the type of construction.

If an occupied roof can be considered a mezzanine, it is not required to be considered a story above grade for the purposes of determining the allowable number of stories.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal simply provides clarification and is not intended as a change.

Internal ID: 1021

G80-18

IBC: TABLE 504.4

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

Revise as follows:

**TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE^{a, b}**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION										TYPE OF CONSTRUCTION	TYPE OF CONSTRUCTION	TYP COM
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV		TYPE IV		TYPE V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A-1	NS	UL	5	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	2	1
	S	UL	6	4	3	4	3	<u>9</u>	<u>6</u>	<u>4</u>	4	3	2
A-2	NS	UL	11	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	2	1
	S	UL	12	4	3	4	3	<u>18</u>	<u>12</u>	<u>6</u>	4	3	2
A-3	NS	UL	11	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	2	1
	S	UL	12	4	3	4	3	<u>18</u>	<u>12</u>	<u>6</u>	4	3	2
A-4	NS	UL	11	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	2	1
	S	UL	12	4	3	4	3	<u>18</u>	<u>12</u>	<u>6</u>	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	<u>1</u>	<u>1</u>	<u>1</u>	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	<u>UL</u>	<u>UL</u>	<u>UL</u>	UL	UL	UL
B	NS	UL	11	5	3	5	3	<u>5</u>	<u>5</u>	<u>5</u>	5	3	2
	S	UL	12	6	4	6	4	<u>18</u>	<u>12</u>	<u>9</u>	6	4	3
E	NS	UL	5	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	1	1
	S	UL	6	4	3	4	3	<u>9</u>	<u>6</u>	<u>4</u>	4	2	2
F-1	NS	UL	11	4	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>		2	1
	S	UL	12	5	3	4	3	<u>10</u>	<u>7</u>	<u>5</u>	5	3	2
F-2	NS	UL	11	5	3	4	3	<u>5</u>	<u>5</u>	<u>5</u>	5	3	2
	S	UL	12	6	4	5	4	<u>12</u>	<u>8</u>	<u>6</u>	6	4	3
H-1	NS ^{c, d}	1	1	1	1	1	1	<u>NP</u>	<u>NP</u>	<u>NP</u>	1	1	NP
	S							<u>1</u>	<u>1</u>	<u>1</u>			
H-2	NS ^{c, d}	UL	3	2	1	2	1	<u>1</u>	<u>1</u>	<u>1</u>	2	1	1
	S							<u>2</u>	<u>2</u>	<u>2</u>			
H-3	NS ^{c, d}	UL	6	4	2	4	2	<u>3</u>	<u>3</u>	<u>3</u>	4	2	1
	S							<u>4</u>	<u>4</u>	<u>4</u>			
H-4	NS ^{c, d}	UL	7	5	3	5	3	<u>5</u>	<u>5</u>	<u>5</u>	5	3	2
	S	UL	8	6	4	6	4	<u>8</u>	<u>7</u>	<u>6</u>	6	4	3
H-5	NS ^{c, d}	4	4	3	3	3	3	<u>2</u>	<u>2</u>	<u>2</u>	3	3	2
	S							<u>3</u>	<u>3</u>	<u>3</u>			
I-1 Condition 1	NS ^{d, e}	UL	9	4	3	4	3	<u>4</u>	<u>4</u>	<u>4</u>	4	3	2
	S	UL	10	5	4	5	4	<u>10</u>	<u>7</u>	<u>5</u>	5	4	3
I-1 Condition 2	NS ^{d, e}	UL	9	4	3	4	3	<u>3</u>	<u>3</u>	<u>3</u>	4	3	2
	S	UL	10	5				<u>10</u>	<u>6</u>	<u>4</u>			
I-2	NS ^{d, f}	UL	4	2	1	1	NP	<u>NP</u>	<u>NP</u>	<u>NP</u>	1	1	NP
	S	UL	5	3				<u>7</u>	<u>5</u>	<u>1</u>			
I-3	NS ^{d, e}	UL	4	2	1	2	1	<u>2</u>	<u>2</u>	<u>2</u>	2	2	1
	S	UL	5	3	2	3	2	<u>7</u>	<u>5</u>	<u>3</u>	3	3	2
I-4	NS ^{d, g}	UL	5	3	2	3	2	<u>3</u>	<u>3</u>	<u>3</u>	3	1	1
	S	UL	6	4	3	4	3	<u>9</u>	<u>6</u>	<u>4</u>	4	2	2
M	NS	UL	11	4	2	4	2	<u>4</u>	<u>4</u>	<u>4</u>	4	3	1
	S	UL	12	5	3	5	3	<u>12</u>	<u>8</u>	<u>6</u>	5	4	2
R-1 ^h	NS ^d	UL	11	4	4	4	4	<u>4</u>	<u>4</u>	<u>4</u>	4	3	2
	S13R	4	4									4	3

	S	UL	12	5	5	5	5	<u>18</u>	<u>12</u>	<u>8</u>	5	4	3
R-2 ^h	NS ^d	UL	11	4	4	4	4	<u>4</u>	<u>4</u>	<u>4</u>	4	3	2
	S13R	4	4	4								4	3
	S	UL	12	5	5	5	5	<u>18</u>	<u>12</u>	<u>8</u>	5	4	3
R-3 ^h	NS ^d	UL	11	4	4	4	4	<u>4</u>	<u>4</u>	<u>4</u>	4	3	3
	S13D	4	4									3	3
	S13R	4	4									4	4
	S	UL	12	5	5	5	5	<u>18</u>	<u>12</u>	<u>5</u>	5	4	4
R-4 ^h	NS ^d	UL	11	4	4	4	4	<u>4</u>	<u>4</u>	<u>4</u>	4	3	2
	S13D	4	4									3	2
	S13R	4	4									4	3
	S	UL	12	5	5	5	5	<u>18</u>	<u>12</u>	<u>5</u>	5	4	3
S-1	NS	UL	11	4	2	3	2	<u>4</u>	<u>4</u>	<u>4</u>	4	3	1
	S	UL	12	5	3	4	3	<u>10</u>	<u>7</u>	<u>5</u>	5	4	2
S-2	NS	UL	11	5	3	4	3	<u>4</u>	<u>4</u>	<u>4</u>	4	4	2
	S	UL	12	6	4	5	4	<u>12</u>	<u>8</u>	<u>5</u>	5	5	3
U	NS	UL	5	4	2	3	2	<u>4</u>	<u>4</u>	<u>4</u>	4	2	1
	S	UL	6	5	3	4	3	<u>9</u>	<u>6</u>	<u>5</u>	5	3	2

~~U-TUL~~ = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB and its various WGs held meetings, studied issues and sought input from various expert sources around the world. The TWB has posted those documents and input on its website for interested parties to follow its progress and to allow those parties to, in turn, provide input to the TWB.

At its first meeting, the TWB discussed a number of performance objectives to be met with the proposed criteria for tall wood buildings:

No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered.

No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios.

No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios.

No unusual fire department access issues.

Egress systems designed to protect building occupants during the design escape time, plus a factor of safety.

Highly reliable fire suppression systems to reduce the risk of failure during reasonably expected fire scenarios. The degree of reliability should be proportional to evacuation time (height) and the risk of collapse.

The comprehensive package of proposals from the TWB meet these performance objectives.

The TWB also determined that fire testing was necessary to validate these concepts. At its first meeting, members discussed the nature and intention of fire testing so as to ensure meaningful results for the TWB and, more specifically, for the fire service. Subsequently a test plan was developed. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of joints, and to evaluate conditions for responding fire personnel. The Fire WG then refined the test plan, which was implemented with a series of five, full-scale, multiple-story building tests at the Alcohol, Tobacco and Firearms (ATF) laboratories in Beltsville, MD. The results of those tests, as well as testing conducted by others, helped form the basis upon which the Codes WG developed its code change proposals. This code change proposal is one of those developed by the Codes WG and approved by the TWB.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3-1/2 minutes each, please visit: <http://bit.ly/ATF-firetestvideos>.

Both of these links were confirmed active on 12/27/17.

Number of Stories

This proposal addresses the building height, in terms of the number of stories, for the three new construction types proposed by the TWB. As set forth in the proposal to Section 602.4, the three new types of construction are Types IV-A, IV-B, and IV-C. The Committee examined each proposed type of construction for its safety and efficacy with regard to each occupancy.

The following approach was considered appropriate for the heights of the new construction types, based on the conclusions of the Committee:

Based upon TWB review of fire safety and structural integrity performance, Type IV-B is equated to Type I-B for height (in number of stories). A noteworthy item is that, per Section 403.2.1.1 of the IBC, Type I-B construction is permitted to be reduced to 1-hour Fire Resistance Rating (FRR); however, the TWB does not propose to allow the same reduction for Type IV-B. As a result, the comparison is between 2-hr mass timber construction that is permitted to be partially unprotected, versus 1-hr Type IB construction, and the Committee believes that 2-hr mass timber construction that is partially exposed per the limits of proposed Section 602.4 warrants the same heights as allowed for 1-hr Type I-B construction;

Type IV-A should be somewhat larger than IV-B, as Type IV-A construction is entirely protected (no exposed mass timber permitted) and the required rating of the structure is equivalent to those required of Type I-A construction (3-hr rating for structural frame). However, the Committee did not find it acceptable to allow the scale of heights (many of which are unlimited) of Type I-A to be applied to Type IV-A. Instead, the Committee applied a multiplier of 1.5 to the heights proposed for Type IV-B construction (rounded up or down based on judgment) in order to propose reasonable height allowances for IV-A construction;

The Committee viewed Type IV-C as sufficiently similar to existing HT construction, especially in terms of the percentage of exposed wood (it is permitted to be entirely unprotected), and the resulting contribution to fire. While the height in feet for Type IV-C is proposed to be equal to the height in feet of Type IV-HT, the Committee felt that additional stories was warranted in some cases. Therefore, in terms of stories, the Committee proposes additional number of stories for Type IV-C construction when compared to traditional Type IV heavy timber construction. The Committee feels that some recognition is warranted for the fire resistance rating requirements (Type IV-C has 2-hour rating on structural elements, whereas traditional Type IV Heavy Timber used dimensional wood, which is understood to yield an approximate fire resistance rating equivalent to about 1-hour construction) and provided that flexibility when developing height, in terms of stories, for Type IV-C construction. A multiplier of 1.5 was applied from the Type IV-HT heights to develop reasonable numbers of stories for Type IV-C construction.

While the base code seems to allow significant heights for buildings without sprinklers (e.g., Table 504.4 currently allows 11 stories for NS Type I-B construction for many occupancy classifications), the Committee believes that no additional heights over what is already permitted for Type IV should be proposed for the NS (non sprinklered) rows. As such, where separate rows are provided for heights for the NS condition, the proposed heights for Types IV-A, IV-B, and IV-C are the same as those heights already permitted for Type IV for the NS condition.

This methodology explains the majority of the recommendations included in this proposal. Specifically, for occupancy groups A, B, E, R, and U, the methodology described above accurately reflects how the height proposals were developed.

The Committee applied professional judgment (from both a fire safety and a structural perspective) to develop a draft table, cell by cell, for all occupancy types. After further examination, reduced heights were proposed for F, H, I, M, and S occupancy classifications.

For F-1 occupancies, the Committee proposed a height of 7 stories for Type IV-B construction (versus the 12 stories currently permitted for I-B construction). A multiplier of 1.5 was used to propose a height of 10 stories for Type IV-A construction (when rounded down). No additional height was proposed for Type IV-C construction (Type IV-C proposed at 5 stories, and 5 stories is already permitted by code for Type IV-HT).

For F-2 occupancies, again the Committee is proposing a reduced number of stories, with 8 stories for Type IV-B construction (versus 12 stories that would be derived from the methodology). Again, a multiplier of 1.5 was used to propose a height of 12 stories for Type IV-A construction. No additional height is proposed for Type IV-C construction (Type IV-C proposed at 6 stories, and 6 stories is already permitted by code for Type IV-HT).

A conservative approach also explains the proposed heights for Group H occupancies. For Group H-1, only 1 story buildings are permitted by Table 504.4 for all construction types, so the proposal was adjusted to also limit all of the new Type IV construction types to 1 story as well.

For Groups H-2, H-3, and H-5, heights were intentionally made equal to the existing Heavy Timber heights. In other words, there is no proposal to any increased heights over what is already allowed by code for these use groups.

Group H-4, being corrosives which represents a health hazard (but not necessarily a fire hazard) to occupants and first responders, was also reduced, slightly. The TWB proposes 7 stories for Type IV-B construction (equivalency to Type I-B would have yielded 8 stories). The proposal allows only 8 stories for Type IV-A construction. No additional height is proposed for Type IV-C construction (Type IV-C proposed at 6 stories, and 6 stories is already permitted by code for Type IV-HT).

For Group I, the Committee took a more conservative approach and proposed an equivalent number of stories for Type IV-A construction, as is provided for Type I-B construction (10 stories for both construction types and occupancy types). The allowable heights for Type IV-B construction were selected to fall between the 10 stories for Type IV-A and the number of stories for Type IV-C construction. The Committee proposed a height of 7 stories for I-1, and 6 stories for I-2. No additional height was proposed for Type IV-C construction (IV-C construction heights in floors is equal to the number of floors already allowed for Type IV-HT, 5 stories for I-1, 4 stories for I-2).

For Group M occupancies, the Committee again took a conservative approach, and proposed an equivalent number of stories for Type IV-A construction, as is provided for Type I-B construction (12 stories for both construction types). The proposal for Type IV-B construction is 8 stories which is based on the use of the multiplier of 1.5 with respect to the Type IV-A proposal. A modest increase (from 5 to 6 stories) is proposed for Type IV-C construction due to the higher requirement for structural fire-resistance.

For Group S, while the base code does not differentiate between S-1 and S-2 in Type I-B construction (both 12 stories), the Committee recognized that the base code does provide a difference for Group F (10 stories for F-1, 12 stories for F-2). As explained above, this led the Committee to propose lower heights for F-1, than for F-2. The Committee felt this was appropriate with respect to the hazard differences between F-1 and F-2. Rather than basing our proposal for S occupancies on the same starting point of 12 stories, the Committee decided to simply copy the proposed heights for Group F into the rows for Group S for both IV-A and IV-B construction types. No additional height is proposed for IV-C construction (IV-C proposed at 5 stories for both S-1 and S-2, same as existing Type IV-HT heights).

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 846

G81-18

IBC: TABLE 504.4, TABLE 506.2

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Revise as follows:

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE^a PLANE^{a, b}

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
F-1	NS	UL	11	4	2	3	2	4	2	1
	S	UL	12	5	3	4	3	5	3	2
F-2	NS	UL	11	5	3	4	3	5	3	2
	S	UL	12	6	4	5	4	6	4	3
H-1	NS ^{c, d}	1	1	1	1	1	1	1	1	NP
	S									
H-2	NS ^{c, d}	UL	3	2	1	2	1	2	1	1
	S									
H-3	NS ^{c, d}	UL	6	4	2	4	2	4	2	1
	S									
H-4	NS ^{c, d}	UL	7	5	3	5	3	5	3	2
	S	UL	8	6	4	6	4	6	4	3
H-5	NS ^{c, d}	4	4	3	3	3	3	3	3	2
	S									
I-1 Condition 1	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5	4	5	4	5	4	3
I-1 Condition 2	NS ^{d, e}	UL	9	4	3	4	3	4	3	2
	S	UL	10	5						
I-2	NS ^{d, f}	UL	4	2	1	1	NP	1	1	NP
	S	UL	5	3						
I-3	NS ^{d, e}	UL	4	2	1	2	1	2	2	1
	S	UL	5	3	2	3	2	3	3	2
I-4	NS ^{d, g}	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2
R-1 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S	UL	12	5	5	5	5	5	4	3
R-2 ^h	NS ^d	UL	11	4	4	4	4	4	3	2

	S	UL	12	5	5	5	5	5	4	3
R-3 ^h	NS ^d	UL	11	4	4	4	4	4	3	3
	S	UL	12	5	5	5	5	5	4	4
R-4 ^h	NS ^d	UL	11	4	4	4	4	4	3	2
	S	UL	12	5	5	5	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	3	1
	S	UL	12	5	3	4	3	5	4	2
S-2	NS	UL	11	5	3	4	3	4 ₅	4	2
	S	UL	12	6	4	5	4	5 ₆	5	3
U	NS	UL	5	4	2	3	2	4	2	1
	S	UL	6	5	3	4	3	5	3	2

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

TABLE 506.2
ALLOWABLE AREA FACTOR (At = NS, S1, S13R, S13D or SM, as applicable) IN SQUARE FEET^a FEET^{a, b}

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION							
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V
		A	B	A	B	A	B	HT	A
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500
	S1	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000
	SM	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500
A-2	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500
A-4	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL
	S1								
	SM								
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000
E	NS	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500
	S1	UL	UL	106,000	58,000	94,000	58,000	102,000	74,000
	SM	UL	UL	79,500	43,500	70,500	43,500	76,500	55,500
F-1	NS	UL	UL	25,000	15,500	19,000	12,000	33,500	14,000
	S1	UL	UL	100,000	62,000	76,000	48,000	134,000	56,000
	SM	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000
F-2	NS	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000
	S1	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000
	SM	UL	UL	112,500	69,000	85,500	54,000	151,500	63,000
H-1	NS ^c	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500
	S1								
H-2	NS ^c	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500
	S1								
	SM								
H-3	NS ^c	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000
	S1								
	SM								
H-4	NS ^{c, d}	UL	UL	37,500	17,500	28,500	17,500	36,000	18,000
	S1	UL	UL	150,000	70,000	114,000	70,000	144,000	72,000
	SM	UL	UL	112,500	52,500	85,500	52,500	108,000	54,000
H-5	NS ^{c, d}	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000
I-1	NS ^{d, e}	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000

	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500
I-2	NS ^{d, f}	UL	UL	15,000	11,000	12,000	NP	12,000	9,500
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500
I-3	NS ^{d, e}	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500
	S1	UL	UL	45,000 60,000	40,000	42,000	30,000	48,000	30,000
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500
I-4	NS ^{d, g}	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000
R-1 ^h	NS ^d	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000
	S13R								
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000
R-2 ^h	NS ^d	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000
	S13R								
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000
R-3 ^h	NS ^d	UL	UL	UL	UL	UL	UL	UL	UL
	S1								
R-4 ^h	SM								
	NS ^d	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000
S-1	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000
	NS	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000
	S1	UL	192,000	104,000	70,000	104,000	70,000	102,000	56,000
S-2	SM	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000
	NS	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000
	S1	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000
U	SM	UL	237,000	117,000	78,000	117,000	78,000	115,500	63,000
	NS ⁱ	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000
	S1	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000
	SM	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000

For SI: 1 square foot = 0.0929 m².

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building area in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the International Fire Code.
- g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.
- i. The maximum allowable area for a single-story nonsprinklered Group U greenhouse is permitted to be 9,000 square feet, or the allowable area shall be permitted to comply with Table C102.1 of Appendix C.

Reason:

Tables 504.4 and 506.2 were introduced into the code by code change G101-12, submitted by the ICC Building Code Action Committee (BCAC), as part of a substantial overhaul of the height and area provisions. The new tables replaced Table 503. It was not the intent of G101-12 to make any changes to allowable building height or area rendered by these provisions, compared to what was previously allowed. This proposed change corrects two tabular value errors that went undetected in the original code change until after the completion of the 2012 cycle: the tabular story height numbers for Type IV Group S-2, and the allowable area factor for Type II-A Group I-3. The following is taken from the 2012 edition of the IBC which shows the height and areas for S-2 and I-3 as shown in Table 503, from which Tables 504.4 and 506.2 were derived.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will decrease the cost of construction .

This is a correction to the height and area tables based upon an error in previous code change submittals. The proposal will restore these values to the correct values. Will actually decrease the cost of construction compared to the current code because more lenient limitations are imposed.

Internal ID: 1548

G82-18

IBC: 505.2.1

Proponent: Todd Snider, West Coast Code Consultants (WC3), representing Self (Todd@KimballEng.com)

2018 International Building Code

Revise as follows:

505.2.1 Area limitation. The aggregate area of a *mezzanine* or *mezzanines* within a room shall be not greater than one-third of the floor area of ~~that a single room or space in which they are located, from which that mezzanine is accessed.~~ The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the *mezzanine* is located. In determining the allowable *mezzanine* area, the area of the *mezzanine* shall not be included in the floor area of the room.

Exceptions:

1. The aggregate area of *mezzanines* in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 503.1.1 shall be not greater than two-thirds of the floor area of the room.
2. The aggregate area of *mezzanines* in buildings and structures of Type I or II construction shall be not greater than one-half of the floor area of the room in buildings and structures equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 and an *approved emergency voice/alarm communication system* in accordance with Section 907.5.2.2.
3. The aggregate area of a *mezzanine* within a *dwelling unit* that is located in a building equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 shall not be greater than one-half of the floor area of the room, provided that:
 - 3.1. Except for enclosed closets and bathrooms, the *mezzanine* shall be open to the room in which such *mezzanine* is located;
 - 3.2. The opening to the room shall be unobstructed except for walls not more than 42 inches (1067 mm) in height, columns and posts; and
 - 3.3. Exceptions to Section 505.2.3 shall not be permitted.

Reason:

Proposed revision to add clarification to the room or space in which a mezzanine is located. The intent of mezzanines is that they are intended to be open to a room and it is no more hazardous to be located within the mezzanine of a room or space than to be in that room or space. Often times, however, this option is being used for mezzanines which are said to be located in one room the only egress is through a different room. For example in grocery floors they will use 1/3 the area of the sales floor but the access to the mezzanine is through the stock room.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The cost of this clarification is impossible to value. It will, at times, change design or layout that could increase or decrease cost.

Internal ID: 1175

G83-18

IBC: 505.2.3

Proponent: Ronald Clements Jr, Chesterfield County Building Inspection Department, representing Chesterfield County Building Inspection Department (clementsro@chesterfield.gov); Lee Kranz, City of Bellevue, WA Representing the Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Keith Flanders, representing self (kflanders@cosentini.com); Todd Snider (Todd@KimballEng.com)

2018 International Building Code

Revise as follows:

505.2.3 Openness. A *mezzanine* shall be open and unobstructed to the room in which such *mezzanine* is located except for walls not more than 42 inches (1067 mm) in height, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the *occupant load* of the aggregate area of the enclosed space is not greater than 10.
2. A *mezzanine* having two or more exits or access to exits is not required to be open to the room in which the *mezzanine* is located.
3. Mezzanines or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the *mezzanine* area.
4. In industrial facilities, *mezzanines* used for control equipment are permitted to be glazed on all sides.
5. ~~In occupancies other than Groups II and I, which are no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a *mezzanine* having two or more exits or access to exits shall not be required to be open to the room in which the *mezzanine* is located.~~

Reason:

Ron Clements

Per exception 2 to section 505.2.3, which was revised in the 2015 IBC, a mezzanine is not required to be open to the room in which the mezzanine is located if the mezzanine has two exits or access to two exits. Exception two has no qualifiers; therefore, exception two would always apply in the conditions listed for exception five. Since exception two will always apply without the sprinkler, story or occupancy group qualifiers required for use of exception five, exception five is no longer needed.

Keith Flanders

Exception 5 is no longer necessary as exception 2 was modified in previous cycles and is less restrictive. Per exception 2, a mezzanine having two or more exits or access to exits is not required to be open to the room in which the mezzanine is located. This is the same as the second part of exception 5, without the occupancy limitations or requirements for a sprinkler system.

Lee Kranz

Exception #5 of Section 505.2.3 is not needed because it is more restrictive and exception #2 in this section will govern in every case.

Todd Snider

Proposed revision to remove Exception 5, because it is redundant to Exception 2.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no cost impact because the exception five that is proposed for deletion is obsolete.

Internal ID: 678

G84-18

IBC: TABLE 506.2

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

Revise as follows:

TABLE 506.2
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, S13D or SM, as applicable) IN SQUARE FEET ^{a, b}

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION							
		TYPE I		TYPE II		TYPE III		TYPE IV	
		A	B	A	B	A	B	A	B
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	<u>45,000</u>	<u>30,000</u>
	S1	UL	UL	62,000	34,000	56,000	34,000	<u>180,000</u>	<u>120,000</u>
	SM	UL	UL	46,500	25,500	42,000	25,500	<u>135,000</u>	<u>90,000</u>
A-2	NS	UL	UL	15,500	9,500	14,000	9,500	<u>45,000</u>	<u>30,000</u>
	S1	UL	UL	62,000	38,000	56,000	38,000	<u>180,000</u>	<u>120,000</u>
	SM	UL	UL	46,500	28,500	42,000	28,500	<u>135,000</u>	<u>90,000</u>
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	<u>45,000</u>	<u>30,000</u>
	S1	UL	UL	62,000	38,000	56,000	38,000	<u>180,000</u>	<u>120,000</u>
	SM	UL	UL	46,500	28,500	42,000	28,500	<u>135,000</u>	<u>90,000</u>
A-4	NS	UL	UL	15,500	9,500	14,000	9,500	<u>45,000</u>	<u>30,000</u>
	S1	UL	UL	62,000	38,000	56,000	38,000	<u>180,000</u>	<u>120,000</u>
	SM	UL	UL	46,500	28,500	42,000	28,500	<u>135,000</u>	<u>90,000</u>
A-5	NS	UL	UL	UL	UL	UL	UL	<u>UL</u>	<u>UL</u>
	S1								
	SM								
B	NS	UL	UL	37,500	23,000	28,500	19,000	<u>108,000</u>	<u>72,000</u>
	S1	UL	UL	150,000	92,000	114,000	76,000	<u>432,000</u>	<u>288,000</u>
	SM	UL	UL	112,500	69,000	85,500	57,000	<u>324,000</u>	<u>216,000</u>
E	NS	UL	UL	26,500	14,500	23,500	14,500	<u>76,500</u>	<u>51,000</u>
	S1	UL	UL	106,000	58,000	94,000	58,000	<u>306,000</u>	<u>204,000</u>
	SM	UL	UL	79,500	43,500	70,500	43,500	<u>229,500</u>	<u>153,000</u>
F-1	NS	UL	UL	25,000	15,500	19,000	12,000	<u>100,500</u>	<u>67,000</u>
	S1	UL	UL	100,000	62,000	76,000	48,000	<u>402,000</u>	<u>268,000</u>
	SM	UL	UL	75,000	46,500	57,000	36,000	<u>301,500</u>	<u>201,000</u>
F-2	NS	UL	UL	37,500	23,000	28,500	18,000	<u>151,500</u>	<u>101,000</u>
	S1	UL	UL	150,000	92,000	114,000	72,000	<u>606,000</u>	<u>404,000</u>
	SM	UL	UL	112,500	69,000	85,500	54,000	<u>454,500</u>	<u>303,000</u>
H-1	NS ^c	21,000	16,500	11,000	7,000	9,500	7,000	<u>10,500</u>	<u>10,500</u>
	S1								
H-2	NS ^c	21,000	16,500	11,000	7,000	9,500	7,000	<u>10,500</u>	<u>10,500</u>
	S1								
	SM								
H-3	NS ^c	UL	60,000	26,500	14,000	17,500	13,000	<u>25,500</u>	<u>25,500</u>
	S1								
	SM								
H-4	NS ^{c, d}	UL	UL	37,500	17,500	28,500	17,500	<u>72,000</u>	<u>54,000</u>
	S1	UL	UL	150,000	70,000	114,000	70,000	<u>288,000</u>	<u>216,000</u>
	SM	UL	UL	112,500	52,500	85,500	52,500	<u>216,000</u>	<u>162,000</u>
H-5	NS ^{c, d}	UL	UL	37,500	23,000	28,500	19,000	<u>72,000</u>	<u>54,000</u>
	S1	UL	UL	150,000	92,000	114,000	76,000	<u>288,000</u>	<u>216,000</u>
	SM	UL	UL	112,500	69,000	85,500	57,000	<u>216,000</u>	<u>162,000</u>
I-1	NS ^{d, e}	UL	55,000	19,000	10,000	16,500	10,000	<u>54,000</u>	<u>36,000</u>
	S1	UL	220,000	76,000	40,000	66,000	40,000	<u>216,000</u>	<u>144,000</u>

	SM	UL	165,000	57,000	30,000	49,500	30,000	<u>162,000</u>	<u>108,000</u>
I-2	NS ^{d, f}	UL	UL	15,000	11,000	12,000	NP	<u>36,000</u>	<u>24,000</u>
	S1	UL	UL	60,000	44,000	48,000	NP	<u>144,000</u>	<u>96,000</u>
	SM	UL	UL	45,000	33,000	36,000	NP	<u>108,000</u>	<u>72,000</u>
I-3	NS ^{d, e}	UL	UL	15,000	10,000	10,500	7,500	<u>36,000</u>	<u>24,000</u>
	S1	UL	UL	45,000	40,000	42,000	30,000	<u>144,000</u>	<u>96,000</u>
	SM	UL	UL	45,000	30,000	31,500	22,500	<u>108,000</u>	<u>72,000</u>
I-4	NS ^{d, g}	UL	60,500	26,500	13,000	23,500	13,000	<u>76,500</u>	<u>51,000</u>
	S1	UL	121,000	106,000	52,000	94,000	52,000	<u>306,000</u>	<u>204,000</u>
	SM	UL	181,500	79,500	39,000	70,500	39,000	<u>229,500</u>	<u>153,000</u>
M	NS	UL	UL	21,500	12,500	18,500	12,500	<u>61,500</u>	<u>41,000</u>
	S1	UL	UL	86,000	50,000	74,000	50,000	<u>246,000</u>	<u>164,000</u>
	SM	UL	UL	64,500	37,500	55,500	37,500	<u>184,500</u>	<u>123,000</u>
R-1 ^h	NS ^d	UL	UL	24,000	16,000	24,000	16,000	<u>61,500</u>	<u>41,000</u>
	S13R								
	S1	UL	UL	96,000	64,000	96,000	64,000	<u>246,000</u>	<u>164,000</u>
	SM	UL	UL	72,000	48,000	72,000	48,000	<u>184,500</u>	<u>123,000</u>
R-2 ^h	NS ^d	UL	UL	24,000	16,000	24,000	16,000	<u>61,500</u>	<u>41,000</u>
	S13R								
	S1	UL	UL	96,000	64,000	96,000	64,000	<u>246,000</u>	<u>164,000</u>
	SM	UL	UL	72,000	48,000	72,000	48,000	<u>184,500</u>	<u>123,000</u>
R-3 ^h	NS ^d	UL	UL	UL	UL	UL	UL	<u>UL</u>	<u>UL</u>
	S13D								
	S13R								
	S1								
	SM								
R-4 ^h	NS ^d	UL	UL	24,000	16,000	24,000	16,000	<u>61,500</u>	<u>41,000</u>
	S13D								
	S13R								
	S1	UL	UL	96,000	64,000	96,000	64,000	<u>246,000</u>	<u>164,000</u>
	SM	UL	UL	72,000	48,000	72,000	48,000	<u>184,500</u>	<u>123,000</u>
S-1	NS	UL	48,000	26,000	17,500	26,000	17,500	<u>76,500</u>	<u>51,000</u>
	S1	UL	192,000	104,000	70,000	104,000	70,000	<u>306,000</u>	<u>204,000</u>
	SM	UL	144,000	78,000	52,500	78,000	52,500	<u>229,500</u>	<u>153,000</u>
S-2	NS	UL	79,000	39,000	26,000	39,000	26,000	<u>115,500</u>	<u>77,000</u>
	S1	UL	316,000	156,000	104,000	156,000	104,000	<u>462,000</u>	<u>308,000</u>
	SM	UL	237,000	117,000	78,000	117,000	78,000	<u>346,500</u>	<u>231,000</u>
U	NS ⁱ	UL	35,500	19,000	8,500	14,000	8,500	<u>54,000</u>	<u>36,000</u>
	S1	UL	142,000	76,000	34,000	56,000	34,000	<u>216,000</u>	<u>144,000</u>
	SM	UL	106,500	57,000	25,500	42,000	25,500	<u>162,000</u>	<u>108,000</u>

For SI: 1 square foot = 0.0929 m².

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building area in accordance with the International Existing Building Code.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the International Fire Code.
- g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.
- i. The maximum allowable area for a single-story nonsprinklered Group U greenhouse is permitted to be 9,000 square feet, or the allowable area shall be permitted to comply with Table C102.1 of Appendix C.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB and its various WGs held meetings, studied issues and sought input from various expert sources around the world. The TWB has posted those documents and input on its website for interested parties to follow its progress and to allow those parties to, in turn, provide input to the TWB.

At its first meeting, the TWB discussed a number of performance objectives to be met with the proposed criteria for tall wood buildings:

No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered.

No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios.

No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios.

No unusual fire department access issues.

Egress systems designed to protect building occupants during the design escape time, plus a factor of safety.

Highly reliable fire suppression systems to reduce the risk of failure during reasonably expected fire scenarios. The degree of reliability should be proportional to evacuation time (height) and the risk of collapse.

The comprehensive package of proposals from the TWB meet these performance objectives.

Allowable Area

In addressing this topic, it was necessary to develop height and area criteria to address each new type of construction being proposed. Relying upon each new type of construction proposed for tall wood buildings (Types IV-A, IV-B and IV-C), the committee examined each type of construction for its safety and efficacy with regard to each occupancy type. This proposal on allowable areas should be considered as a companion proposal to the height proposals. The three proposals were developed with regard to one another as well as with regard to the new types of construction.

The TWB also determined that fire testing was necessary to validate these concepts. At its first meeting, members discussed the nature and intention of fire testing so as to ensure meaningful results for the TWB and, more specifically, for the fire service. Subsequently a test plan was developed. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stairway. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of joints, and to evaluate conditions for responding fire personnel. The Fire WG then refined the test plan, which was implemented with a series of five full-scale, multiple-story building tests at the Alcohol, Tobacco and Firearms (ATF) laboratories in Beltsville, MD. The results of those tests, as well as testing conducted by others, helped the Committee form the basis upon which the Codes WG developed its code change proposals. This code change proposal is one of those developed by the Codes WG and adopted by the TWB.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3-1/2 minutes each, please visit: <http://bit.ly/ATF-firetestvideos>.

Both of these links were confirmed active on 12/27/17.

Each proposed new type of construction was examined for its fire safety characteristics and compared to the existing, long-standing type of construction known as Heavy Timber. The committee found that it was reasonable to develop a multiplier which could be applied to the traditional HT areas. This was done for each new type of construction. Thus, the proposed new Type IV-C was 1.25 times the HT allowable area, IV-B was 2.00 times the HT allowable area and IV-A was 3.00 times the HT allowable area.

These multipliers were examined in terms of relative performance compared to traditional HT. They were reexamined on a case-by-case basis based upon relative hazard and occupancy classification. Some hazards were perceived to be greater and, thus, areas were adjusted downward to reflect the hazard. Other situations were similarly considered. For example, Hazardous and Institutional occupancies do not fully follow the multiplier method, as most areas for those occupancies were reduced from what the multiplier method would suggest.

Also, the committee reconsidered this proposal with respect to the companion height proposal. This review was to be sure that allowable areas were commensurate with the risk posed by being allowed on some particular story or at some height above grade plane.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 849

G85-18

IBC: 506.2.1, 506.2.3, 506.2.2, 506.2.4

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

Revise as follows:

506.2.1 Single-occupancy buildings. ~~The allowable area of each story of a single-occupancy building with no more than one story above grade plane shall be determined in accordance with Equation 5-1:~~

where:

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S1, S13R or S13D value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

The allowable area per story of a single-occupancy building with a maximum of three stories above grade shall be determined by Equation 5-1. The allowable area per story of a single-occupancy building more than three stories above grade plane shall be determined in accordance with Equation 5-2:

$$A_a = [A_t + (NS \times I_f)] \times S_a \quad \text{(Equation 5-2)}$$

where:

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

S_a = 3 where the actual number of stories above grade plane, exceeds three, or

S_a = 4 where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

The actual area of any individual floor shall not exceed the allowable area per Equation 5-1.

Delete without substitution:

506.2.3 Single-occupancy, multistory buildings. ~~The allowable area of a single-occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2:~~

$$A_a = [A_t + (NS \times I_f)] \times S_a \quad \text{(Equation 5-2)}$$

where:

A_a = Allowable area (square feet):

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

S_a = Actual number of building stories above grade plane, not to exceed three. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed four.

No individual story shall exceed the allowable area (A_a) as determined by Equation 5-2 using the value of $S_a = 1$.

Revise as follows:

506.2.2 Mixed-occupancy one-story buildings. The allowable area of a floor of a mixed-occupancy building with not more than one story above grade plane shall be determined in accordance with the applicable provisions of Section 508.1 based on Equation 5-1 for each applicable occupancy Section 508.3.2 for non separated occupancies and 508.4.2 for separated occupancies.

For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

$A_a = [A_t + (NS \times I_f)]$ (Equation 5-3)

where:

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

Exception: For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

Delete without substitution:

~~**506.2.4 Mixed-occupancy, multistory buildings.** Each story of a mixed-occupancy building with more than one story above grade plane shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.~~

-

{Equation 5-3}

where:

A_a = Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

~~**Exception:** For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories determined in accordance with Equation 5-3 based on the applicable~~

Reason:

Several changes have been made to simplify the process of determining the maximum area of buildings since the 2012 edition of the IBC. However, the provisions for how to address the actual calculation and maximum building areas has not been modified.

This change attempts to follow the lead of those that put together the changes to consolidate the increases for area and height into tables removing the requirement to do the actual calculations for those adjustments. Users of the code often become confused with the provisions for single story buildings and multiple story buildings and then it becomes even more complicated with the application of multiple occupancies, accessory occupancies and incidental occupancies. The new language will remove some of that confusion.

506.2.1 currently only appears to address the area of a one-story building. In reality it affects the allowable area of any story of any building of any height. This change has simplified Section 506.2.1 to indicate that the allowable area of a story must be determined by equation 501. Then the requirements for the allowable area for the building that is over three stories must be calculated to determine the proportional limit.

By eliminating Section 506.2.3 the criteria for the allowable area of a single-occupancy building with more than one story can be found as part. In reality, it only controls single-occupancy buildings that are more than 3 stories. The first,

second and third story of any building is controlled by the allowed area in Equation 5-1. This change has directed the code user to apply Equation 5-2 to single-occupancy buildings with more than three stories. Finally, the language regarding an "individual story" is changed to be the actual area of an individual floor being limited by the area allowed by Equation 5-1 as allowed in 506.2.1.

506.2.2 currently parallels 506.2.1 and indicates that it only limits the allowable area of a one-story building, when in fact it also covers the allowed area of any story of any building of any height. It also implies that it is limited by Equation 5-1. In reality the requirements of Section 508.3.2 and 508.4.2 set the limits for mixed use unseparated and mixed use separated conditions. This change directs the code user to those sections for mixed-occupancy buildings.

506.2.4 duplicates the requirements for mixed-occupancy buildings but in lieu of going to the specific provisions in 508.1 for mixed-occupancy buildings it simply references 508.1. With the change to 506.2.2, this provision is not necessary as it has already been covered.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no change or impact from this change because it is simply an editorial reorganization of existing text

Internal ID: 1705

G86-18

IBC: 506.3.2, 506.3.3, 506.3.3 (New), Table 506.3.3 (New)

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (stthomas@coloradocode.net)

2018 International Building Code

Revise as follows:

506.3 Frontage increase. Every building shall adjoin or have access to a *public way* to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Sections 506.3.1 through 506.3.3.

506.3.1 Minimum percentage of perimeter. To qualify for an area factor increase based on frontage, a building shall have not less than 25 percent of its perimeter on a *public way* or open space. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved *fire lane*.

506.3.2 Minimum frontage distance. To qualify for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance ~~(W)~~ of 20 feet (6096 mm) measured at right angles from the building face to any of the following:

1. The closest interior lot line.
2. The entire width of a street, alley or public way.
3. The exterior face of an adjacent building on the same property.

~~Where the value of W is greater than 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the building area increase based on frontage, regardless of the actual width of the *public way* or open space. Where the value of W varies along the perimeter of the building, the calculation performed in accordance with Equation 5-5 shall be based on the weighted average calculated in accordance with Equation 5-4.~~

~~Equ5_4.jpg~~

~~(Equation 5-4)~~

~~where:~~

~~W (Width: weighted average) = Calculated width of *public way* or open space (feet).~~

~~L_n = Length of a portion of the exterior perimeter wall.~~

~~w_n = Width (≥ 20 feet) of a *public way* or open space associated with that portion of the exterior perimeter wall.~~

~~F = Building perimeter that fronts on a *public way* or open space having a width of 20 feet (6096 mm) or more.~~

~~**Exception:** Where a building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot (18 288 mm) *public way* or yard requirement, and the value of W is greater than 30 feet (9144 mm), the value of W shall not exceed 60 feet (18 288 mm).~~

~~The frontage increase shall be based on the smallest *public way* or open space that is 20 feet (6096 mm) or greater, and the percentage of building perimeter having a minimum 20 feet (6096 mm) *public way* or open space.~~

506.3.3 Amount of increase. The area factor increase based on frontage shall be determined in accordance with Equation 5-5:

~~$I_f = [F/P - 0.25]W/30$~~

~~$I_f = [F/P - 0.25]W/30$~~

~~(Equation 5-5)~~

~~where:~~

~~I_f = Area factor increase due to frontage.~~

~~F = Building perimeter that fronts on a *public way* or open space having minimum distance of 20 feet (6096 mm).~~

~~P = Perimeter of entire building (feet).~~

~~W = Width of *public way* or open space (feet) in accordance with Section 506.3.2.~~

~~Table 506.3.3.~~

~~$I_f = [F/P - 0.25]W/30$~~

Add new text as follows:

**Table 506.3.3
FRONTAGE INCREASE FACTOR**

<u>Percentage (%) of Perimeter</u>	<u>Open Space</u>			
	<u>0 to less than 20 Feet</u>	<u>20 to less than 25 Feet</u>	<u>25 to less than 30 Feet</u>	<u>30 Feet or greater</u>
<u>0 to less than 25</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>25 to less than 50</u>	<u>0</u>	<u>0.17</u>	<u>0.21</u>	<u>0.25</u>
<u>50 to less than 75</u>	<u>0</u>	<u>0.33</u>	<u>0.42</u>	<u>0.50</u>
<u>75 to 100</u>	<u>0</u>	<u>0.5</u>	<u>0.63</u>	<u>0.75</u>

Reason:

Calculating the frontage increase is a confusing process for little benefit. This proposal simplifies the process by creating a table outlining the increase based on the percentage of open space around the building and the distance of that open space. It still uses the concept of the percentage of open space around the building. The values in the table are based on the calculations using Equation 5-5. The proposal also deletes the confusing weighted average calculation that most people do not use.

For example, if you have a building that has a perimeter of open space of 63% and the smallest open space is 25 feet, the increase would be 0.42. Using the calculation in Equation 5-5, it would be 0.32. This is a 10% difference. The total increase for a Group B Occupancy of Type VB Construction would be 2,790 square feet using the equation and 3,780 using the table. This is a difference of 990 square feet. This is negligible in the overall scheme of allowable area calculations.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a simplification of an existing calculation in the code. It should not affect the cost of construction.

Internal ID: 1071

G87-18

IBC: 508.3.1.2

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

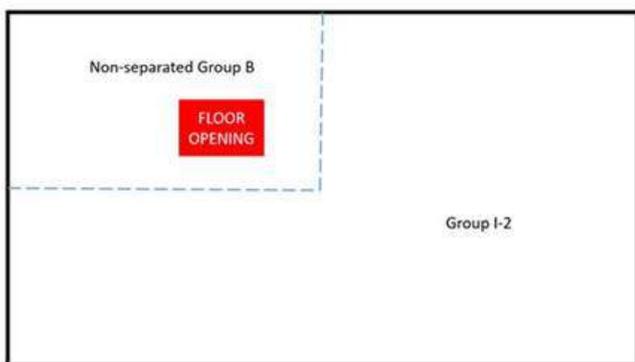
2018 International Building Code

Revise as follows:

508.3.1.2 Group I-2, Condition 2 occupancies. Where one of the nonseparated occupancies is Group I-2, Condition 2, the ~~most restrictive~~ requirements of Sections 407, 509 and 712 shall apply throughout the fire area containing the Group I-2 occupancy. The ~~most restrictive~~ requirements of Chapter 10 for Group I-2, Condition 2 shall apply to the path of egress from the Group I-2, Condition 2 occupancy up to and including the exit discharge.

Reason:

This section relates to the use of non-separated mixed uses in hospitals. Historically a hospital building has broadly been considered as an I-2 occupancy. However, designs are increasingly using this non-separated option to create situations that adversely impact the I-2 occupancy. This language was added in the previous cycle to with the intent to require certain non-separated facility designs to follow some of the basic requirements for Group I-2, Condition 2 hospitals. The goal was to point designers and code officials to four key components to consider when designing non-separated uses: Section 407 which contains specific healthcare requirements, Section 509 for incidental uses, Section 712 for vertical openings and Chapter 10 for egress. Failure to follow these could have adverse impacts on patients and staff. For example, unprotected floor openings allowed by 712 are prohibited in Group I-2, they are not prohibited in Group B. Without this section, a design would be allowed to punch a hole in the floor that adversely affects the I-2 patients on that floor.



An unintended consequence of the language is that by referencing the “most restrictive” requirements, the section prohibits the use of any exception permissible for Group I-2. It also doesn’t clearly identify which requirements should be considered. For example, we did not intend to apply Group H restrictions on these conditions just because they are more restrictive. There are several exceptions that should be maintained for these parts of the building, especially in Chapter 10. This change clarifies that all of the I-2 specific requirements apply, whether they are more or less restrictive.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will decrease the cost of construction .

This clarification would remove requirements for more restrictive provisions where hospital provisions apply.

Internal ID: 1288

G88-18

IBC: TABLE 508.4

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Revise as follows:

**TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)^f**

OCCUPANCY	A, E		I-1 ^a , I-3, I-4		I-2		R ^a		F-2, S-2 ^b , U		B ^e , F-1, M, S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3	2	NP
I-1 ^a , I-3, I-4	<u>1</u>	<u>2</u>	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	<u>2</u>	<u>NP</u>	<u>2</u>	<u>NP</u>	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R ^a	<u>1</u>	<u>2</u>	<u>N</u>	<u>N</u>	<u>2</u>	<u>NP</u>	N	N	1 ^c	2 ^c	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2 ^b , U	<u>N</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>N</u>	<u>N</u>	<u>1^c</u>	<u>2^c</u>	N	N	1	2	NP	NP	3	4	2	3	2	NP
B ^e , F-1, M, S-1	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>NP</u>	<u>N</u>	<u>N</u>	<u>1</u>	<u>2</u>	N	N	NP	NP	2	3	1	2	1	NP
H-1	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>	N	NP	NP	NP	NP	NP	NP	NP
H-2	<u>3</u>	<u>4</u>	<u>3</u>	<u>NP</u>	<u>3</u>	<u>NP</u>	<u>3</u>	<u>NP</u>	<u>3</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>NP</u>	<u>NP</u>	N	NP	1	NP	1	NP
H-3, H-4	<u>2</u>	<u>3</u>	<u>2</u>	<u>NP</u>	<u>2</u>	NP	<u>2</u>	<u>NP</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>NP</u>	<u>NP</u>	<u>1</u>	<u>NP</u>	1 ^d	NP	1	NP
H-5	2	NP	2	NP	2	NP	2	NP	2	NP	1	NP	NP	NP	1	NP	1	NP	N	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not Permitted.

- a. See Section 420.
- b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.
- c. See Section 406.3.2.
- d. Separation is not required between occupancies of the same classification.
- e. See Section 422.2 for ambulatory care facilities.
- f. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring fire protection systems shall also comply with Section 707.3.10 and Table 707.3.10 in accordance with Section 901.7.

Reason:

Filling in the balance of Table 508.4 will avoid confusion and make the table more clear and functional.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is an editorial change and adds no new requirements to the code.

Internal ID: 3018

G89-18

IBC: 508.4.4.1, 509.4.1.1 (New)

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

508.4.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

Revise as follows:

508.4.4.1 Construction. Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. Mass timber elements serving as fire barriers or horizontal assemblies to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an approved thermal barrier consisting of a minimum of $\frac{1}{2}$ inch (12.7 mm) gypsum board or a noncombustible equivalent.

Add new text as follows:

509.4.1.1 Type IV-B and IV-C construction. Where Table 509 specifies a fire-resistance-rated separation, mass timber elements serving as fire barriers or a horizontal assembly in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of a minimum of $\frac{1}{2}$ inch (12.7 mm) gypsum board or a noncombustible equivalent.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

This code change proposal represents one of many submitted designed to address a new type of construction called mass timber (e.g. new construction types IV-A, IV-B, and IV-C).

On this subject of “fire barriers,” the committee determined that additional measures were necessary to address cases where mass timber is serving as a fire barrier or horizontal assembly. Section 508.4 describes the third option for separating mixed occupancies within a building. Section 509.4 discusses the fire-resistance rated separation that is required for incidental uses within a larger use group. Section 509 also permits, when stated, protection by an automatic sprinkler system without fire barriers, however the construction enclosing the incidental use must resist the passage of smoke in accordance with Section 509.4.2.

The concern is that without any modifications to these provisions regulating separated occupancies and incidental uses, a fire barrier or horizontal assembly could be designed using mass timber that would comply with the fire resistance rating, but which would allow any exposed mass timber to contribute to the fuel load. This can occur in Types IV-B and IV-C construction.

The committee applied professional judgment by choosing to emulate the existing thermal barrier requirements by applying those requirements to these two sections. The intent of this proposal is to have the thermal barrier delay or prevent the ignition of the mass timber, thus delaying or preventing the mass timber’s contribution to the fuel load. This will also allow additional time for fire and life safety measures to be executed as well as allow first responders additional time to perform their services.

The committee’s intent is that the thermal barrier only needs to cover an exposed wood surface. The thermal barrier is not required in addition to any noncombustible protection that is required in Section 602.4, nor does it add to the fire resistance rating of the mass timber.

Mass timber walls or floors serving as fire barriers for separated uses (Section 508.4) would need to have a thermal barrier on both faces of the assembly.

For Section 509.4 (incidental use separations) the intent is to provide the thermal barrier only on the side where the hazard exists, that is, the side facing the incidental use. For example, if a mass timber floor assembly of the incidental use contains a noncombustible topping this provision would not require the addition of a thermal barrier on mass timber surfaces not facing the incidental use area. In addition, the thermal barrier would not be required if the sprinkler option is exercised.

It should be noted that this proposal is only addressing the contribution of exposed mass timber's face to the fuel load of a fire, and is not recommending any modifications to the fire resistance requirements of Sections 508 or 509 or to the other mass timber provisions.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 960

G90-18

IBC: 508.1, 508.5, 508.5.1, 508.5.2, 508.5.3, 508.5.4, 508.5.5, 508.5.6, 508.5.7, 508.5.8, 508.5.9, 508.5.10, 508.5.11

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Delete without substitution:

~~SECTION 419 LIVE/WORK UNITS~~

Revise as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 ~~or~~, 508.4, 508.5, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 510.
2. Where required by Table 415.6.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a *detached building* or structure.
3. ~~Uses within live/work units, complying with Section 419, are not considered separate occupancies.~~

~~419.1-508.5~~ **General Live/Work Units.** A *live/work unit* shall comply with Sections ~~419.1-508.5~~ through ~~419.9-508.5.11~~.

Exception: Dwelling or sleeping units that include an office that is less than 10 percent of the area of the *dwelling unit* are permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2.

~~419.1-1508.5.1~~ **Limitations.** All of the following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m²) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

~~419.2-508.5.2~~ **Occupancies.** *Live/work units* shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the *live/work unit* where the *live/work unit* is in compliance with Section ~~419-508.5~~. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a *live/work unit*.

Exception: Storage shall be permitted in the *live/work unit* provided that the aggregate area of storage in the nonresidential portion of the *live/work unit* shall be limited to 10 percent of the space dedicated to nonresidential activities.

~~419.3-508.5.3~~ **Means of egress.** Except as modified by this section, the *means of egress* components for a *live/work unit* shall be designed in accordance with Chapter 10 for the function served.

~~419.3-1508.5.4~~ **Egress capacity.** The egress capacity for each element of the *live/work unit* shall be based on the occupant load for the function served in accordance with Table 1004.5.

~~419.3-2508.5.5~~ **Spiral stairways.** *Spiral stairways* that conform to the requirements of Section 1011.10 shall be permitted.

~~419.4-508.5.6~~ **Vertical openings.** Floor openings between floor levels of a *live/work unit* are permitted without enclosure.

[F] ~~419.5-508.5.7~~ **Fire protection.** The *live/work unit* shall be provided with a monitored *fire alarm* system where

required by Section 907.2.9 and an *automatic sprinkler system* in accordance with Section 903.2.8.

419-6508.5.8 Structural. Floors within a *live/work unit* shall be designed for the live loads in Table 1607.1, based on the function within the space.

419-7508.5.9 Accessibility. Accessibility shall be designed in accordance with Chapter 11 for the function served.

419-8508.5.10 Ventilation. The applicable *ventilation* requirements of the International Mechanical Code shall apply to each area within the *live/work unit* for the function within that space.

419-9508.5.11 Plumbing facilities. The nonresidential area of the *live/work unit* shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the *live/work unit* is required to be *accessible* by Section 1107.6.2.1, the plumbing fixtures specified by Chapter 29 shall be *accessible*.

Reason:

Relocating Section 419 on Live/Work Units to Section 508 Mixed Occupancies provides a clearer description under Mixed Use Occupancies since the unit is not only residential nor business use. An example is a doctor's office occupying part of a detached dwelling, or townhouses with an office, store or restaurant on the first floor and a residence occupying parts or all of upper floors.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is an editorial relocation of existing requirements.

Internal ID: 2257

G91-18

IBC: [F] TABLE 509

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (BCAC@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

**[F] TABLE 509
INCIDENTAL USES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input ^a	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower ^a	1 hour or provide automatic sprinkler system
Refrigerant machinery room ^a	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms ^a	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the International Fire Code	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Electrical installations and transformers ^a	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m³.

a. See Chapter 6 of the International Fire Code for additional construction related requirements.

Reason:

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

This is a simple footnote pointer so designers are aware of additional construction and/or installation requirements for these incidental use building systems that are located in Chapter 6 of the International Fire Code.

This proposal is part of a comprehensive update to IFC Chapter 6 by the F-CAC. F-CAC fully supports this proposal.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal adds a pointer to existing requirements in the IFC. No new or additional construction requirements are being introduced into the IBC.

Internal ID: 347

G92-18

IBC: [F] TABLE 509

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Robert Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

2018 International Building Code

Revise as follows:

**[F] TABLE 509
INCIDENTAL USES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu perhour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E,I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies otherthan Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops notclassified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the International Fire Code	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m³.

Reason:

This proposal eliminates stationary storage battery systems as incidental use from Table 509. A rewrite of the IFC Section 1206 has added extensive protection features to such installations including detection, suppression, fire separation, and explosion control, along with large scale testing to document the effectiveness of chosen protection levels. With the increased level of protection mandated by the IFC, there is no longer a need to limit such uses to 10% of a floor area as an incidental use.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will decrease the cost of construction .

Eliminating the incidental use 10% floor area restriction can reduce the cost of providing energy storage systems in mixed use buildings.

Internal ID: 251

G93-18

IBC: 509.3

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com); Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2018 International Building Code

**[F] TABLE 509
INCIDENTAL USES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the International Fire Code	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m³.

509.2 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1. Incidental uses shall be included in the building occupancies within which they are located.

Delete without substitution:

~~**509.3 Area limitations.** Incidental uses shall not occupy more than 10 percent of the *building area* of the story in which they are located.~~

Reason:

We submitted changes to eliminate the 10% area limitation on incidental uses over the last two code cycles. Each of those proposals were disapproved by the committee and the membership. We were told by the opponents, the way to fix the problem is to require incidental uses over 10% of the story area to be classified as an occupancy. Independently we each drafted a proposed change to say that if one incidental use; or an aggregate of incidental uses on a story exceeds the 10% limit that they would be classified as a distinct occupancy. The more we tried to provide rationale for such a change, to more the construct came crashing down.

The original purpose of incidental uses that are all specifically listed in Table 509 is to address a hazard of one type or another. Each of the uses in Table 509 poses a hazard to the balance of the primary use of the building or story. The solutions to address those risks are rated separations, automatic sprinkler system or both. The hazard exists whether the use is 5% of a story, 15% or a story or 50% of a story. The protection needs to be provided regardless of the area of the incidental use(s). The 10% limit is particularly impractical and onerous if strictly enforced on the health care industry. Laboratories, laundry rooms, maintenance shops, storage rooms; waste and linen collection - going over 10% is a frequent design issue.

The solution urged on us is to say things that are an incidental use when limited to 10% of the story (and part of the primary occupancy) are to be called a different occupancy when they get larger doesn't work either way you try to wrap the code around it.

A. Distinct uses - no longer incidental uses. If we say that these uses exceeding 10% of story are something else and no longer an incidental use, then the protections required by Table 509 disappear. If we assign other occupancies then we are left to rely on Section 508 mixed occupancies to provide protections. But often the protections will be less. In a non-separated approach you may get a fully sprinklered building, but you won't get rated separations. In a separated mixed occupancy approach you might get sprinklers; you might get rated separations; and sometimes you might get both, but you aren't going to be assured of the protections required for the smaller things allowed under incidental uses.

B. Distinct uses - but still incidental uses. If we say that these uses exceeding 10% are another occupancy AND remain an incidental use in order to preserve the protections. What have we done? We've proved that the 10% limit is meaningless because you are still getting the protections of incidental uses regardless of size.

A final point about assigning other occupancy categories to these uses (when exceeding 10%) is that the application of the code will be inconsistent from jurisdiction to jurisdiction; from project to project.

Eliminating the 10% limit makes sure that each of these uses in Table 509 will be consistently protected from project to project; jurisdiction to jurisdiction.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is intended to clarify the code language.

Internal ID: 239

G94-18

IBC: 510.2

Proponent: Lawrence Lincoln, Salt Lake City Corporation, representing Self (larry.lincoln@slcgov.com)

2018 International Building Code

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 all of the following conditions are met:

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

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

1. The building above the *horizontal assembly* is not required to be of Type I construction;
 2. The enclosure connects fewer than four *stories*; and
 3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.
4. Where buildings above the horizontal assembly are of Type III, IV or V construction, stairways within enclosures specified in Item 3 shall be constructed of either noncombustible materials or fire retardant treated wood.

~~5.4-~~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.

~~6.5-~~ 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.

~~7.6-~~The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

Reason:

IBC section 1011.7 requires that Stairway construction be built of materials consistent with the types permitted for the type of construction of the building. Buildings designed in accordance with section 510.2 are inherently of two different types of construction where the horizontal assembly is the dividing line. When taking into consideration the materials that would be consistent with the type of construction of the stairway construction within a fire-rated stair enclosure, the transition from combustible materials (above the horizontal assembly) to noncombustible materials (below the horizontal assembly) makes no sense within the fire-rated stair enclosure when the type of construction above the horizontal assembly is of type III, IV or V and the type of construction below the horizontal assembly is type I-A (required by section 510.2). In other words, it makes no sense to transition from combustible materials to noncombustible materials when you are within the same environment (the fire-rated stair enclosure). Please note that this code proposal would allow fire-retardant-treated wood as a construction material within that portion of the fire-rated stair enclosure that is part of the type I-A construction. Since fire is never anticipated to originate within a fire-rated stair enclosure, this allowance seems reasonable.

Cost Impact

The code change proposal will decrease the cost of construction .

The proposed code change will decrease the cost of construction as this code change would lessen a code requirement.

Internal ID: 2337

G95-18

IBC: 510.2, 1011.7, 1023.2 (IFC[BE] 1011.7, 1023.2)

Proponent: Lee Kranz, representing City of Bellevue, WA (lkranz@bellevuewa.gov)

2018 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 all of the following conditions are met:

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

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

1. The building above the *horizontal assembly* is not required to be of Type I construction;
 2. The enclosure connects fewer than four *stories*; and
 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 both of 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 than 300, or Group B, M, R or S occupancies.
 - 5-6. 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.
 - 6-7. 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*.

1011.7 Stairway construction. *Stairways* shall be built of materials consistent with the types permitted for the type of construction of the building, ~~except that wood handrails shall be permitted for all types of construction.~~

Exceptions:

1. Wood handrails shall be permitted in all types of construction.
2. Interior exit stairway in accordance with Section 510.2

1023.2 Construction. Enclosures for interior exit *stairways* and *ramps* shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. *Interior exit stairway* and *ramp* enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit *stairways* or *ramps* shall include any *basements*, but not any *mezzanines*. *Interior exit stairways* and *ramps* shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. *Interior exit stairways* and *ramps* in Group I-3 occupancies in accordance with the provisions of

Section 408.3.8.

2. *Interior exit stairways* within an *atrium* enclosed in accordance with Section 404.6.
3. Interior exit stairway in accordance with Section 510.2.

Reason:

In podium buildings utilizing a 3-hour fire-resistance rated horizontal assembly constructed in accordance with Section 510.2 it is very common for the building above the horizontal assembly to be of combustible construction, including the landings, stair stringers and treads. The code currently requires that a transition be made from wood to metal, or some other non-combustible materials, within the stair enclosure at the point where the stair goes from being located in a combustible building to the Type IA non-combustible building. This is not practical or warranted. Fires do not typically start within the fire-resistance rated stair enclosure. Exception #4.2 of this proposal provides additional protection by requiring that the stair shaft be of not less than a 3-hour fire resistance rating with 3-hour rated door assemblies as required by Section 716. This essentially creates a vertical offset of the 3-hour horizontal assembly which is currently allowed by Section 510.2. This section states that "Where vertical offsets are provided as part of a horizontal assembly, the vertical offset and the structure supporting the vertical offset shall have a fire-resistance rating of not less than 3 hours."

We have also included two 'pointer' exceptions in Chapter 10. Without the pointer exceptions someone might argue that these Chapter 10 provisions are more restrictive and override the exception in 510.2. The exemption for wood handrails currently found in the text of Section 1011.7 has been reformatted by placing it into exception #1.

Cost Impact

The code change proposal will decrease the cost of construction .

Allowing stairs to be of combustible construction will be less expensive then if they were required to be of non-combustible materials. Also, the cost to design the stair will be reduced because a transition from wood to steel (or other non-combustible materials) will no longer be required.

Internal ID: 83

G96-18

IBC: 510.3

Proponent: David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

Revise as follows:

510.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage with not more than one *story above grade plane* and located below a Group S-2 open *parking garage* shall be classified as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the *fire-resistance* requirements of the Group S-2 *open parking garage*.
3. The height and the number of tiers of the Group S-2 *open parking garage* shall be limited as specified in Table 406.5.4.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 *open parking garage* shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 *open parking garage*, except *exit* openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m²) and mechanical equipment rooms ~~incidental to associated with~~ the operation of the building.

Reason:

The use of the term incidental can be confused with Section 509 and the list in Table 509. Office, waiting room and toilet rooms are not "incidental" per Section 509.

Cost Impact

The code change proposal will decrease the cost of construction .

Reducing the confusion over what is permitted within a garage will reduce the time required for design, review and approval of projects and will thus reduce costs.

Internal ID: 1748

G97-18

IBC: 510.4

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

Revise as follows:

510.4 Parking beneath Group R. Where a ~~maximum one story above grade plane~~ Group S-2 parking garage, ~~one story above grade plane~~, enclosed or open, or combination thereof, of Type I construction or open of Type IV construction, with a grade entrance, is ~~provided under~~ located below a building of Group R building, the ~~Group S-2 parking garage and Group R building shall be considered separate and distinct buildings~~. The number of *stories* to be used in determining the minimum type of construction ~~of the Group R building~~ shall be measured from the floor above ~~such a the parking area garage~~. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a *fire-resistance rating* not less than the mixed occupancy separation required in Section 508.4. The maximum building height in feet shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the grade plane.

Reason:

The current language in this section is confusing and awkward. This section addresses the upper height limit in stories, but does not address it in feet.

Cost Impact

The code change proposal will decrease the cost of construction .

By clarifying the intent of the code the cost of design, review and approval of projects should be simplified and reduce the overall cost of construction.

Internal ID: 1749

G98-18

IBC: 510.5

Proponent: Lee Kranz, City of Bellevue, WA, representing City of Bellevue, WA (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows:

510.5 Group R-1 and R-2 buildings of Type IIIA construction. ~~The height limitation for~~ For buildings of Type IIIA construction in Groups R-1 and R-2 ~~the maximum allowable height in Table 504.3 shall be increased to six stories and 75 feet (22 860 mm) by 10 feet and the maximum allowable number of stories in Table 504.4 shall be increased by one~~ where the first floor assembly above the *basement* has a *fire-resistance rating* of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated *fire walls* into areas of not more than 3,000 square feet (279 m²).

Reason:

The 20 foot increase in building height and one additional story specified in Section 504.2 of the 2012 IBC was deleted and replaced by Tables 504.3 and 504.4 in the 2015 IBC. Tables 504.3 and 504.4 include the increases that used to be specified in Section 504.2 of the 2012 IBC. This created an anomaly in Section 510.5 for height in the current code. Section 510.5 now specifies that the height for Group R-1 and R-2 of Type III-A construction shall be increased to 75' if the building complies with the conditions indicated in this section. Since the Tables already include the pre-calculated increases for sprinklers the increase indicated in Section 510.5 is lost in the translation. This proposal clarifies what the increases are in Section 510.5 and creates consistency with the height and story increases that were previously specified in Section 504.2 of the 2012 IBC. There are no substantive changes from the original provisions of Section 504.2 of the 2012 IBC proposed.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a correction to add clarity in the code. It will not impact the cost of construction.

Internal ID: 1127

G99-18

IBC: 510.8

Proponent: David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

Revise as follows:

510.8 Group B or M buildings with Group S-2 open parking garage above. Group B or M occupancies located below a Group S-2 *open parking garage* of a lesser type of construction shall be considered as a separate and distinct building from the Group S-2 *open parking garage* for the purpose of determining the type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 2 hours.
2. The occupancies in the building below the *horizontal assembly* are limited to Groups B and M.
3. The occupancy above the *horizontal assembly* is limited to a Group S-2 *open parking garage*.
4. The building below the *horizontal assembly* is of Type IA construction.

Exception: The building below the *horizontal assembly* shall be permitted to be of Type IB or II construction, but not less than the type of construction required for the Group S-2 *open parking garage* above, where the building below is not greater than *one story* in height above grade plane.

5. The height and area of the building below the *horizontal assembly* does not exceed the limits set forth in Section 503.
6. The height and area of the Group S-2 *open parking garage* does not exceed the limits set forth in Section 406.5. The height, in both feet and *stories*, of the Group S-2 *open parking garage* shall be measured from *grade plane* and shall include the building below the *horizontal assembly*.
7. Exits serving the Group S-2 open parking garage discharge directly shall discharge at grade with direct and unobstructed access to a street or public way and are separated from the building below the *horizontal assembly* by 2-hour *fire barriers* constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

Reason:

This section requires discharge from the parking garage directly to a street or public way which seems overly restrictive. This will allow an unobstructed path to be used to get access to the street or public way.

Cost Impact

The code change proposal will decrease the cost of construction .

The ambiguity in the code should be reduced by this change that will save money in the design of buildings, as well as the review and approval process.

Internal ID: 1751

G100-18

IBC: 602.1, 602.2 (New), 602.2.1, 602.2.2, 602.2.3, , 602.2.4, 602.3 (New), , 602.3.1, 602.3.2, 602.3.3

Proponent: Gregory Keith, representing The Boeing Company (grkeith@mac.com)

2018 International Building Code

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections ~~602.2-602.2.1~~ through ~~602.5-602.2.4~~. The building elements shall have a *fire-resistance rating* not less than that specified in Table 601 ~~and exterior and shall be constructed of materials as required by Sections 602.2 and 602.3 for the applicable type of construction.~~ Exterior walls shall have a *fire-resistance rating* not less than that specified in Table 602. Where required to have a *fire-resistance rating* by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

602.2 Building element construction materials. Building elements listed in Table 601 shall be constructed of materials in accordance with the provisions of this section.

~~602.2.1~~ **Types I and II construction.** All building elements in buildings of Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code shall be constructed of noncombustible materials.

Exception: Combustible materials are permitted to be used as listed below and elsewhere in this code.

1. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted as follows:
 - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
 - 1.2. Nonbearing exterior walls where fire-resistance rated construction is not required.
 - 1.3. Roof construction, including girders, trusses, framing and decking. In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
2. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
3. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
4. Wall construction of freezers and coolers of less than 1000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials where the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Materials used on or within building elements in buildings of Type I or II construction shall comply with Section 602.3.

~~602.3~~ **602.2.2 Type III construction.** Exterior walls in buildings of Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code shall be constructed of materials complying with Section 602.2.1.

Exception: Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of having a 2-hour fire-resistance-rating or less. Interior building elements in buildings of Type III construction shall be of any material permitted by this code.



~~602.4~~ **602.2.3 Type IV (Heavy Timber, HT) construction.** Exterior walls in buildings of Type IV construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are (Heavy Timber, HT) construction shall be constructed of materials complying with Section 602.2.1.

Exceptions:

1. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness and having a fire-resistance rating of 2-hours or less.
2. Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall

assemblies not less than 6 inches (152 mm) in thickness and having a 2-hour fire-resistance rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

- 2.1. Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than $\frac{15}{32}$ inch (12 mm) thick;
 - 2.2. Gypsum board not less than $\frac{1}{2}$ inch (12.7 mm) thick; or
 - 2.3. A noncombustible material.
3. Where a fire separation distance of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted.

Interior building elements shall be of solid wood, laminated wood, heavy timber (HT) or structural composite lumber (SCL) without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL), and cross-laminated timber and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.1 or 602.4.2 shall be permitted.

Exception: Interior walls and partitions having not less than a 1-hour fire-resistance rating or heavy timber complying with Section 2304.11.2.2 shall be permitted.

~~**602.4.1 Fire-retardant-treated wood in exterior walls.** *Fire-retardant treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.*~~

~~**602.4.2 Cross-laminated timber in exterior walls.** *Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:*~~

- ~~1. *Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than $\frac{15}{32}$ inch (12 mm) thick;*~~
- ~~2. *Gypsum board not less than $\frac{1}{2}$ inch (12.7 mm) thick; or*~~
- ~~3. *A noncombustible material.*~~

~~**602.4.3 Exterior structural members.** *Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.*~~

~~**602.5602.2.4 Type V-V construction.** *All building elements in buildings of Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are shall be constructed of any materials permitted by this code.*~~

602.3 Materials used on or within building elements. All construction materials used on or within building elements listed in Table 601 for buildings of Type I or II construction and exterior walls in Type III or IV (HT) construction shall be noncombustible, except that combustible materials are permitted to be used as listed below and elsewhere in this code.

1. Blocking such as for handrails, millwork, cabinets and window and door frames.
2. Millwork such as doors, door frames, window sashes and frames.
3. Trim installed in accordance with Section 806.
4. Nailing or furring strips in accordance with Section 803.15.
5. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
6. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
7. Exterior plastic veneer installed in accordance with Section 2605.2.
8. Interior wall and ceiling finishes installed in accordance with Section 803.

9. Interior floor finish and floor covering materials installed in accordance with Section 804.
10. Finish flooring installed in accordance with Section 805.
11. Roof coverings that have an A, B or C classification.
12. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
13. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

Exceptions:

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
 2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
14. Foam plastics in accordance with Chapter 26.
 15. Light-transmitting plastics as permitted by Chapter 26.
 16. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.
 17. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
 18. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15 respectively.
 19. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
 20. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
 21. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
 22. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
 23. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

SECTION 603 COMBUSTIBLE MATERIAL IN TYPES I AND II CONSTRUCTION

603.1 Allowable materials. ~~Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:~~

1. ~~*Fire-retardant-treated wood* shall be permitted in:~~
 - 1.1: ~~Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.~~
 - 1.2: ~~Nonbearing exterior walls where fire-resistance-rated construction is not required.~~
 - 1.3: ~~Roof construction, including girders, trusses, framing and decking.~~

Exception: ~~In buildings of Type IA construction exceeding two stories above grade plane, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).~~
 - 1.4: ~~Balconies, porches, decks and exterior stairways not used as required exits on buildings three stories or less above grade plane.~~
2. ~~Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.~~

Exceptions:

1. ~~Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.~~
2. ~~Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.~~

3. ~~Foam plastics in accordance with Chapter 26.~~
4. ~~Roof coverings that have an A, B or C classification.~~
5. ~~Interior floor finish and floor covering materials installed in accordance with Section 804.~~
6. ~~Millwork such as doors, door frames, window sashes and frames.~~
7. ~~Interior wall and ceiling finishes installed in accordance with Section 803.~~
8. ~~Trim installed in accordance with Section 806.~~
9. ~~Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.~~
10. ~~Finish flooring installed in accordance with Section 805.~~
11. ~~Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.~~
12. ~~Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.~~
13. ~~Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.~~
14. ~~Blocking such as for handrails, millwork, cabinets and window and door frames.~~
15. ~~Light-transmitting plastics as permitted by Chapter 26.~~
16. ~~Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.~~
17. ~~Exterior plastic veneer installed in accordance with Section 2605.2.~~
18. ~~Nailing or furring strips as permitted by Section 803.15.~~
19. ~~Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.~~
20. ~~Aggregates, component materials and admixtures as permitted by Section 703.2.2.~~
21. ~~Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.~~
22. ~~Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.~~
23. ~~Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.~~
24. ~~Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.~~
25. ~~Materials exposed within plenums complying with Section 602 of the International Mechanical Code.~~
26. ~~Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.~~

~~603.1-1602.3.1 Ducts.~~ The use of nonmetallic ducts shall be permitted where installed in accordance with the limitations of the International Mechanical Code.

~~603.1-2602.3.2 Piping.~~ The use of combustible piping materials shall be permitted where installed in accordance with the limitations of the International Mechanical Code and the International Plumbing Code.

~~603.1-3602.3.3 Electrical.~~ The use of electrical wiring methods with combustible insulation, tubing, raceways and related components shall be permitted where installed in accordance with the limitations of this code.

Reason:

During the last code development cycle the ICC Building Code Action Committee (BCAC) submitted a proposal that reorganized the combustible materials allowances presently contained in Section 603.1. The General Code Committee disapproved the proposal. The published statement explaining the committee action included, "the committee appreciated the effort to reorganize these provisions, but there were concerns that it was incomplete."

The Boeing Company agreed with the concept, but felt that the proposal was not as comprehensive as it should be.

Boeing rewrote the proposal and submitted it as a public comment. The public comment was approved by a 2/3 majority of those voting members in attendance at the public comment hearings. Subsequent to that action it was discovered that an exception relating to the use of fire-retardant materials in Type III buildings had been omitted. The Boeing Company contacted voting members to urge them to vote for disapproval of the public comment during the remote voting phase. The public comment was disapproved as a final action.

Based on the positive reaction to the concept of the public comment, a similar proposal is being submitted for this code development cycle. Necessarily, the proposal is updated so as to be based on 2018 IBC provisions. The major flaw with the BCAC proposal was that it redistributed the current items at Section 603.1 throughout the code. Although many dislike "laundry lists," in this case a "one stop shop" for the various combustible construction materials allowances greatly benefits building designers and code enforcement officials alike.

This proposal accomplishes two things. It rewords Section 602 provisions so that the construction materials provisions are easily understood. Currently, several provisions that represent exceptions to the base requirement for noncombustible materials are contained within the text. Those allowances are now appropriately identified as exceptions. Secondly, the proposal reorganizes the Section 603.1 items in a hierarchy based on their likelihood of use.

The provision is largely editorial. Some language has been clarified for functionality. For instance, current Section 602.4.3 states, "Where a horizontal separation of 20 feet or more is provided,..." Horizontal separation is a nebulous term with no defined end points. That term has been replaced by the more appropriate term "fire separation distance." Also, currently Section 603.1 indicates that the following items are applicable to Types I and II construction.

Literally interpreted, this would not allow for those items applicable to exterior wall construction to be permitted in buildings of Type III and IV construction. This proposal corrects that oversight.

What follows is a listing of the former and proposed locations for each of the Section 603.1 items.

<u>Former Section 603.1</u>	<u>Proposed Location</u>
1.)	602.2.1, Item 1
2.)	602.3, Item 13
3.)	602.3, Item 14
4.)	602.3, Item 11
5.)	602.3, Item 9
6.)	602.3, Item 2
7.)	602.3, Item 8
8.)	602.3, Item 3
9.)	602.3, Item 5
10.)	602.3, Item 10
11.)	602.2.1, Item 2
12.)	602.2.1, Item 3
13.)	602.3, Item 6
14.)	602.3, Item 1
15.)	602.3, Item 15
16.)	602.3, Item 16
17.)	602.3, Item 7
18.)	602.3, Item 4
19.)	602.3, Item 12
20.)	602.3, Item 17
21.)	602.3, Item 18
22.)	602.3, Item 19
23.)	602.3, Item 20
24.)	602.3, Item 21
25.)	602.3, Item 22
26.)	602.2.1, Item 4

This proposal essentially represents an overhaul of the Sections 602 and 603 construction materials provisions.

Approval of this proposal will result in more uniform interpretations of these fundamental code provisions by providing users with requirements that are in technical context with their given application based on the specific type of construction, exterior or interior wall, etc.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is essentially an editorial revision that changes no current requirements.

Internal ID: 1577

G101-18

IBC: TABLE 601

Proponent: Homer Maiel, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2018 International Building Code

Revise as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame ^f (see Section 202)	3 ^{a, b}	2 ^{a, b}	1 ^b	0	1 ^b	0	HT	1 ^b	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1 1 ^a	0 0	2 1	2 0	2 1/HT ^g	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ^{1/2} ^b	1 ^{b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.
- g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a fire resistance rating of not less than 1 hour.

Reason:

Cross laminated timber was introduced into the 2015 IBC. Section 2304.11.2.2 and table 601 permit 4 inch heavy timber walls that do not have a fire resistance rating to serve as bearing walls in structures that could be as many as 6 stories tall for a group B occupancy building. Generally heavy timber dimensions for vertical elements result in building elements that have a fire resistance rating in the ballpark of 45 minutes to 1 hour or more. CLT walls as thin as 4 inches can support the tributary loads from floors of 5 stories but when a 4 inch thick CLT wall is fully loaded and exposed without protection, it may have an intrinsic structural fire resistance rating of less than 30 minutes. This is not a problem for columns because they tend to grow bigger with a commensurate intrinsic fire resistance as buildings get taller.

This proposal modifies Table 601 to require heavy timber bearing walls supporting more than two floors or a floor and a roof to be of 1-hour fire resistance rating or greater which is appropriate for vertical elements in mid-rise multi-story buildings. If a designer desires to have an exposed CLT bearing wall supporting multiple stories they may need to increase the thickness of the wall to provide 1 hour fire resistance rating. This may be calculated in accordance with Chapter 16 of the National Design Specification as allowed in Section 722.1 or they may need to utilize a tested wall.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal will increase the cost of construction in certain instances of tall non-residential Type IV buildings. This proposal will not increase the cost of construction for Type IV residential occupancy groups because Section 420, Section 508.3.3 exception 2, and Section 711 already require bearing walls of Type IV construction to be a minimum of one hour fire resistance rated for R occupancy groups with no exceptions for sprinklers.

Internal ID: 1960

G102-18

IBC: TABLE 601

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

2018 International Building Code

Revise as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame ^f (see Section 202)	3 ^{a, b}	2 ^{a, b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ^{1/2} ^b	1 ^{b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.

Reason:

The exception in footnote **c** for using heavy timber in roof construction has in the past been applied to all roof elements, including those that may fit within the definition of Primary Structural Frame, which came into the code later. However, some code officials have not permitted the use of footnote **c** for roof members that fit the definition of primary structural frame, since there is a separate row for primary structural frame in the table. We believe the correct interpretation is to allow the footnote to apply to all roof construction, including structural members that are part of the primary structural frame.

In the last cycle, a similar phrase, “including protection of primary structural frame members” and the qualifier “in roof construction” was approved for footnote **b**, which permits roof construction, including roof members that are part of the primary structural frame, to be unprotected when every part of the roof construction is more than 20 feet above the floor below (G167-15, AS). In a similar manner, this code change will clarify that footnote **c** is intended to permit all roof construction with a required rating of one hour or less to be heavy timber.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change clarifies interpretation of existing language giving more options to designers. Because of that it will not increase or decrease the cost of construction.

Internal ID: 1787

G103-18

IBC: 202, TABLE 601, 704.4

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

Revise as follows:

[BG] PRIMARY STRUCTURAL FRAME. The primary structural frame shall include all of the following structural members:

1. The columns.
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
3. Members of the floor construction and roof construction having direct connections to the columns.
4. ~~Bracing members~~ Members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame ~~whether or not the bracing member carries gravity loads~~ loading.

[BG] SECONDARY STRUCTURAL MEMBERS. The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns.
2. Members of the floor construction and roof construction not having direct connections to the columns.
3. Bracing members ~~other than those that are~~ not designated as part of the ~~a~~ primary structural frame of bearing wall.

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame ^f (see Section 202)	3 ^{a, b}	2 ^{a, b}	1 ^b	0	1 ^b	0	HT	1 ^b	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	1 ^{1/2} ^b	1 ^{b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.

704.4 Protection of secondary structural members. Secondary structural members that are required to have protection to achieve a *fire-resistance rating* shall be protected by individual encasement protection.

Reason:

The definitions for the terms “primary structural frame” and “secondary members” are proposed to be modified so as to:

- update the terms to adequately address new technologies,
- to remove parts of the definition which could be considered archaic, and
- to remove what was viewed as redundant language.

The new technologies being addressed is mass timber (e.g. glu-laminated, structural composite, cross laminated). The proposed cleanup of this language will allow designers and code officials to better identify the structural characteristics, such as when an entire building is constructed of mass timber panels (e.g. no columns). This will also benefit the same parties when other new materials technologies enter the market.

The proposal focuses on modifying the “bracing members” subcategories where over time with modifications the current language has become difficult to distinguish between the two. One example being when a lateral support member does not act as an element that part of the vertical stability of the structure, what is it? When reviewed multiple responses were received suggesting the language in the definitions needed greater clarity.

The proposal also have removed language from “Primary Structural Frame” that was felt to be redundant (e.g. the term “bracing”)

These terms are used in Chapter 6 “Types of Construction,” Chapter 7 “Smoke and Fire Protection Features,” and Appendix L “Requirements for Fire Fighting Air Replenishing Systems,” and focus on the fire resistance characteristics of those structural elements. These terms are not used in Chapter 16 “Structural” nor the materials chapters of the IBC.

Adding the word “structural” to the term “Secondary structural member” clarifies the intent and link to the definition for “primary structural members”. The word “structural” is also added to the applicable portions of Table 601.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC Fire Code Action Committee (FCAC). The 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 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>. The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal represents a clarification of the definitions to more clearly align with the original intent of the terms.

G104-18

IBC: TABLE 601

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

2018 International Building Code

Revise as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV HT	TYPE V	
	A	B	A ^a	B	A ^a	B		A ^a	B
Primary structural frame ^f (see Section 202)	3 ^{a, b}	2 ^{a, b}	1 ^b	0	1 ^b	0	HT	1 ^b	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ^{1/2} ^b	1 ^{b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.
- g. Except in Group H, I and R occupancies where an automatic sprinkler system in accordance with Section 903.3.1.1 is required by Section 903.2, such system shall be allowed to be substituted for 1-hour fire-resistance-rated construction provided that the height and tabular allowable area factor of buildings are limited to the values specified in the NS rows of Tables 506.2 and Table 504.3. This substitution shall not be permitted for exterior walls.

Reason:

This proposal reinstates an exception that that was taken out in the 2015 IBC due to concerns over enforcement. It was argued that the previous language, which allowed a reduction in fire resistance ratings when a full NFPA 13 sprinkler system was installed but not needed, could not be accurately enforced because there are so many exceptions and reductions to the provisions of the code that are permitted by the installation of a sprinkler system.

It was further argued that there was no cost increase by taking out the footnote since those projects that are taking the one-hour reduction along with non-allowed trade-offs are non-compliant anyway. The footnote was taken out with the justification that it removed an unnecessary level of complication.

The deletion of the footnote provides a disincentive to sprinkler small buildings where sprinklers are not mandatory. Fire sprinklers are very effective in controlling fires in such buildings. Furthermore, this proposal provides easily enforceable language that is more consistent with the way in which the footnote had been successfully used since the first edition of the IBC and within the UBC legacy code prior to the IBC. Group H, I, and R occupancies that are required to have a full NFPA 13 sprinkler system may not take advantage of this footnote.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal allows a reduction in the fire-resistance rating of construction in some cases if automatic sprinklers are provided. Because the footnote is optional, it reasonable to assume it only be utilized to take advantage of the cost savings.

Internal ID: 1685

G105-18

IBC: TABLE 602

Proponent: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2018 International Building Code

Revise as follows:

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^a,
d, g

FIRE SEPARATION DISTANCE =X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H^e	OCCUPANCY GROUP F-1, M, S-1^f	OCCUPANCY GROUP A, B, E, F-2, I, Rⁱ, S-2, U^h
X < 5 ^b	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1	1 ^c
	IIA, VB, IIIA	1	0	0
	Others	1	1	1 ^c
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. See Section 706.1.1 for party walls.
- c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- e. For special requirements for Group H occupancies, see Section 415.6.
- f. For special requirements for Group S aircraft hangars, see Section 412.3.1.
- g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
- h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
- i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

Reason:

It is inconsistent to require Type IIIB to have one hour fire resistance on the exterior of a wall but permit Type IIB and Type VB to have zero hour rating. Consider:

1. Type IIIB and IIB have the same allowable heights indicating they are considered equivalent. See table 504.3
2. Type IIIB has either small allowable areas or equal to Type IIB indicating they are considered nearly equivalent for protection from fire based on the occupancy. Table 506.2
3. The number of stories permitted for Type IIB and Type IIIB are the same. Exception: I-2 occupancies. See table 504.4
4. Both type IIB and IIIB construction a non-combustible exterior finish or cladding. See section 602.2 and 602.3
5. While no fire rating is assigned, it is recognized that the wall will have a rating less than one hour based on typical construction practices, Type IIIB with zero rating on the exterior side of the wall will perform as well or better than a zero hour rated Type IIB wall.
6. The fire rating from the interior side of a Type IIIB wall will have a two-hour rating or more in all cases. A Type IIB wall from the interior side can have no rating in some cases.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

It adds an option to the code to include IIIB. All other types of building are not modified, no option is being subtracted and thus I would suggest no cost impact.

If one were building IIB, VB, etc construction prior to code change, they may still do so after the code change. It remains the same. No one will be forced to use IIIB.

Internal ID: 880

G106-18

IBC: 602.3

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. *Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within *exterior wall* assemblies of a 2-hour rating or less. Where a floor or roof assembly creates a membrane penetration in the exterior wall assembly of Type III construction, the materials within the penetration shall be noncombustible or fire-retardant-treated wood framing as permitted by this section.

Reason:

This addition of language provides clarification of what is considered part of the exterior wall assembly of Type III construction. Specifically, assemblies penetrating the exterior wall assembly in Type III construction are considered part of the exterior wall assembly.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no anticipated cost increase or decrease for this clarification.

Internal ID: 1664

G107-18

IBC: 602.3, 602.4.1, 602.4.2

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

2018 International Building Code

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. ~~Nonbearing fire-retardant-treated wood framing within exterior wall assemblies of a 2-hour rating or less less provided the required fire resistance is maintained and the exposed outer and inner faces of such walls are noncombustible.~~

602.4.1 Fire-retardant-treated wood in exterior walls. ~~Fire~~Nonbearing fire-retardant-treated wood with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6-inches in thickness with a 2-hour rating provided the required fire resistance is maintained and the exposed outer and inner faces of such walls are noncombustible.

602.4.2 Cross-laminated timber in exterior walls. Cross-laminated timber complying with Section 2303.1.4 or less, provided the exterior ~~surface and interior surfaces~~ of the cross-laminated timber ~~is~~are protected by one the following and the required fire resistance rating is maintained:

1. ~~Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than $1\frac{5}{32}$ inch (12 mm) thick;~~
2. Gypsum board not less than $\frac{1}{2}$ inch (12.7 mm) thick; or
3. A noncombustible material.

Reason:

Historically building construction types in older building codes and the previous legacy codes are described based on noncombustible and/or combustible materials utilized in the building structural elements. The construction types range from buildings with no combustible structural framing, to those with noncombustible exterior walls and some combustible structural framing on the interior of the building, to buildings where the majority of the structural framing is combustible. This concept of describing the building construction type based on these combinations of noncombustible and/or combustible materials is reflected in the types of construction found in the International Building Code.

Changes to the building code that allow the use of fire retardant treated wood for Types III and IV construction and cross-laminated lumber for Type IV construction have reduced the clarity in the code that these two types of construction are required to have the exterior load-bearing portions of the structure to be noncombustible materials. This is evident by the requirements in the first sentence to both 602.3 Type III and 602.4 Type IV specifying exterior walls to be noncombustible materials. It is implied, but not as clear by the language in the last sentence of 602.3 for Type III construction and in 602.4.1 and 602.4.2 of Type IV construction, where fire retardant treated wood and cross-laminated lumber are permitted to be used "within" the exterior wall. This term "within" indicates the combustible materials are permitted for use as a component in the exterior wall but the structural exterior wall is still required to be noncombustible.

For Types III and IV construction, the use of fire retardant treated wood (FRTW) in exterior walls of noncombustible construction embodied in the IBC language is presumed to come from the last edition of the Uniform Building Code (UBC). In the 1997 UBC edition, upon which portions of the IBC were based, Section 503.4.3 stated "In Types III and IV construction, approved fire-retardant treated wood framing may be used within the assembly of exterior walls when Table 5-A allows a fire resistive rating of 2-hours or less provided the required fire resistance is maintained and the exposed outer and inner faces of such walls are noncombustible". The 1997 UBC is presumed to be the source of this provision since the last editions of the BOCA National Building Code - NBBC (1996) and the Standard Building Code - SBC (1997) were consistent and did not permit FRTW, whether bearing or non-bearing, in exterior walls of Types III or IV construction.

This change will make clear that the bearing portion of the exterior walls in Types III and IV construction, with FRTW "within" the wall, must be noncombustible to qualify for that type of construction. In addition to the FRTW being "within" the exterior wall, the previous language whereby the fire resistance rating of any exterior wall is maintained and that the exposed outer and inner surfaces of such walls are noncombustible have been included for these and CLT

exterior walls, consistent with the original provisions in the 1997 UBC.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no cost impact from this change. It only clarifies the intent of the code.

Internal ID: 1588

G108-18

IBC: 202, 602.4, 602.4.1, 602.4.1.1 (New), 604.2.4.1.2(New), 602.4.1.2.1 (New), 602.4.1.3 (New), 602.4.1.4 (New), 602.4.1.5 (New), 602.4.1.6 (New), 602.4.2, 602.4.2.1 (New), 602.4.2.2 (New), 602.4.2.2.1 (New), 602.4.2.2.2 (New), 602.4.2.2.3 (New), 602.4.2.2.4 (New), 602.4.2.3 (New), 602.4.2.4 (New), 602.4.2.5 (New), 602.4.2.6 (New), 602.4.3, 602.4.3.1 (New), 602.4.3.2 (New), 602.4.3.3 (New), 602.4.3.4 (New), 602.4.3.5 (New), 602.4.3.6 (New), 602.4.4(New), , TABLE 601, TABLE 602

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BS] WALL, LOAD-BEARING. Any wall meeting either of the following classifications:

1. Any metal or wood stud wall that supports more than 100 pounds per linear foot (1459 N/m) of vertical load in addition to its own weight.
2. Any *masonry* or concrete, or mass timber wall that supports more than 200 pounds per linear foot (2919 N/m) of vertical load in addition to its own weight.

Add new definition as follows:

MASS TIMBER. Structural elements of Type IV construction primarily of solid, built-up, panelized or engineered wood products that meet minimum cross section dimensions of Type IV construction.

NONCOMBUSTIBLE PROTECTION (FOR MASS TIMBER).

Noncombustible material, in accordance with Section 703.5, designed to increase the fire-resistance rating and delay the combustion of mass timber.

Revise as follows:

602.4 Type IV. ~~Type IV construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated wood, heavy timber (HT) or structural composite lumber (SCL) without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL), and cross-laminated timber and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.1 or 602.4.2 shall be permitted. Interior walls and partitions not less than 1-hour fire-resistance rating or heavy timber complying with Section 2304.11.2.2 shall be permitted.~~

Type IV construction is that type of construction in which the building elements are mass timber or noncombustible materials and have fire resistance ratings in accordance with Table 601. Mass timber elements shall meet the fire resistance rating requirements of this section based on either the fire resistance rating of the noncombustible protection, the mass timber, or a combination of both and shall be determined in accordance with Section 703.2 or 703.3. The minimum dimensions and permitted materials for building elements shall comply with the provisions of this section and Section 2304.11. Mass timber elements of Types IV A, IV B and IV C construction shall be protected with noncombustible protection applied directly to the mass timber in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the noncombustible protection shall be determined in accordance with Section 703.8 and comply with 722.7.

Cross-laminated timber shall be labeled as conforming to the heat performance requirements of Section 6.1.3.4 of DOC PS1 and have no delamination in any specimen, except where occurring at a localized characteristic when permitted in the product standard.

Exterior load-bearing walls and nonload-bearing walls shall be mass timber construction, or shall be of noncombustible construction.

Exception: Exterior load-bearing walls and nonload-bearing walls of Type IV-HT Construction in accordance with Section 602.4.4.

The interior building elements, including nonload-bearing walls and partitions, shall be of mass timber construction or of noncombustible construction.

Exception: Interior building elements and nonload-bearing walls and partitions of Type IV-HT Construction in

accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, B, and C, construction with an occupied floor located more than 75 feet above the lowest level of fire department access, up to and including 12 stories or 180 feet above grade plane, mass timber interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 stories or 180 feet above grade plane, interior exit and elevator hoistway enclosures shall be constructed of non-combustible materials.

Add new text as follows:

602.4.1 Type IV-A. Building elements in Type IV-A construction shall be protected in accordance with Sections 602.4.1.1 through 602.4.1.6. The required fire resistance rating of noncombustible elements and protected mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.1.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1(a). All components of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.1.2 Interior protection. Interior faces of all mass timber elements, including the inside faces of exterior mass timber walls and mass timber roofs, shall be protected with materials complying with Section 703.5

602.4.1.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(a), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(b) shall be permitted to be used for compliance with Section 722.7.1.

602.4.1.3 Floors. The floor assembly shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with 602.4.1.2.

602.4.1.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.1.2. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.1.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Sections 602.4.1.2.

602.4.1.6 Shafts. Shafts shall be permitted in accordance with Sections 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

602.4.2 Type IV-B. Building elements in Type IV-B construction shall be protected in accordance with Sections 602.4.2.1 through 602.4.2.6. The required fire resistance rating of noncombustible elements or mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.2.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with non-combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1(a). All components of the exterior wall covering shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354, and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.2.2 Interior protection. Interior faces of all mass timber elements, including the inside face of exterior mass timber walls and mass timber roofs, shall be protected, as required by this section, with materials complying with Section 703.5.

602.4.2.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(a), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(b) shall be permitted to be used for compliance with Section 722.7.1.

602.4.2.2.2 Protected area. All interior faces of all mass timber elements shall be protected in accordance with Section 602.4.2.2.1, including the inside face of exterior mass timber walls and mass timber roofs.

Exceptions: Unprotected portions of mass timber ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20% of the floor area in any dwelling unit or fire area; or
2. Unprotected portions of mass timber walls, including attached columns, shall be permitted and shall be limited to an area equal to 40% of the floor area in any dwelling unit or fire area; or
3. Unprotected portions of both walls and ceilings of mass timber, including attached columns and beams, in any dwelling unit or fire area shall be permitted in accordance with section 602.4.2.2.3.
4. Mass timber columns and beams which are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

602.4.2.2.3 Mixed unprotected areas. In each dwelling unit or fire area, where both portions of ceilings and portions of walls are unprotected, the total allowable unprotected area shall be determined in accordance with Equation 6-1.

$(U_{tc}/U_{ac}) + (U_{tw}/U_{aw}) \leq 1$ (Equation 6-1) where:

U_{tc} = Total unprotected mass timber ceiling areas

U_{ac} = Allowable unprotected mass timber ceiling area conforming to Section 602.4.2.2.2, Exception 1

U_{tw} = Total unprotected mass timber wall areas

U_{aw} = Allowable unprotected mass timber wall area conforming to Section 602.4.2.2.2, Exception 2

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each dwelling unit or fire area, unprotected portions of mass timber walls and ceilings shall be not less than 15 feet from unprotected portions of other walls and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls measured horizontally along the floor.

602.4.2.3 Floors. The floor assembly shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

602.4.2.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with 602.4.2.2 except, in nonoccupiable spaces, they shall be treated as a concealed space with no portion left unprotected. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.2.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

602.4.2.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

602.4.3 Type IV-C. Building elements in Type IV-C construction shall be protected in accordance with Sections 602.4.3.1 through 602.4.3.6. The required fire resistance rating of building elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.3.1 Exterior protection. The exterior side of walls of combustible construction shall be protected with non-

combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1(a). All components of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.3.2 Interior protection. Mass timber elements are permitted to be unprotected.

602.4.3.3 Floors. Floor finishes in accordance with Section 804 shall be permitted on top of the floor construction.

602.4.3.4 Roofs. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.3.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1(a).

602.4.3.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Shafts and elevator hoistway and interior exit stairway enclosures shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1(a), on both the inside of the shaft and the outside of the shaft.

602.4.4 Type IV-HT. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated heavy timber or structural composite lumber (SCL), without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL) and cross laminated timber (CLT) and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted. Interior walls and partitions not less than one hour fire resistance rating or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

Revise as follows:

~~602.4.1~~**602.4.4.1 Fire-retardant-treated wood in exterior walls.** *Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.

~~602.4.2~~**602.4.4.2 Cross-laminated timber in exterior walls.** *Cross-laminated timber* complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

1. *Fire-retardant-treated wood* sheathing complying with Section 2303.2 and not less than ¹⁵/₃₂ inch (12 mm) thick;
2. *Gypsum board* not less than ¹/₂ inch (12.7 mm) thick; or
3. A noncombustible material.

~~602.4.3~~**602.4.4.3 Exterior structural members.** Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame ^f (see Section 202)	3 ^{a, b}	2 ^{a, b}	1 ^b	0	1 ^b	0	3 ^a	2 ^a	2 ^a	HT	1 ^b	0
Bearing walls Exterior ^{e, f} Interior	3 3 ^a	2 2 ^a	1 1	0 0	2 1	2 0	3 3	2 2	2 2	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602											
Nonbearing walls and partitions Interior ^d	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ^{1/2} ^b	1 ^{b, c}	1 ^{b, c}	0 ^c	1 ^{b, c}	0	1 1/2	1	1	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^a,
d, g

FIRE SEPARATION DISTANCE =X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H^e	OCCUPANCY GROUP F-1, M, S-1^f	OCCUPANCY GROUP A, B, E, F-2, I, Rⁱ, S-2, U^h
X < 5 ^b	All	3	2	1
5 ≤ X < 10	IA, <u>IVA</u>	3	2	11
	Others	2	1	
10 ≤ X < 30	IA, IB, <u>IVA, IVB</u>	2	1	1 ^c
	IIB, VB	1	0	0
	Others	1	1	1 ^c
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. See Section 706.1.1 for party walls.
- c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- e. For special requirements for Group H occupancies, see Section 415.6.
- f. For special requirements for Group S aircraft hangars, see Section 412.3.1.
- g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
- h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
- i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB and its various WGs held meetings, studied issues and sought input from various expert sources around the world. The TWB has posted those documents and input on its website for interested parties to follow its progress and to allow those parties to, in turn, provide input to the TWB.

At its first meeting, the TWB discussed a number of performance objectives to be met with the proposed criteria for tall wood buildings:

No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered.

No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios.

No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios.

No unusual fire department access issues.

Egress systems designed to protect building occupants during the design escape time, plus a factor of safety.

Highly reliable fire suppression systems to reduce the risk of failure during reasonably expected fire scenarios. The degree of reliability should be proportional to evacuation time (height) and the risk of collapse.

The comprehensive package of proposals from the TWB meet these performance objectives.

Definitions

Included in the proposal for Section 602.4 are three new/revised definitions; Wall, Load-Bearing; Mass Timber; and Noncombustible protection (for mass timber). They are important to understanding the subsequent proposed change to Section 602.4.

Load-bearing wall: The modification to the term “load-bearing wall” has been updated to include “mass timber” as a category equivalent to that of masonry or concrete. Based on the research done by the wood trade associations, mass timber walls (e.g. sawn, glued-laminated, cross-laminated timbers) have the ability to support the minimum 200 pounds per linear foot vertical load requirement.

Mass Timber: The term “mass timber” is being proposed to represent both the legacy heavy timber (a.k.a. Type IV construction) and the three (3) new construction types that are proposed for Chapter 6 of the IBC. The purpose of creating this term and definition was to establish a single term which represented the various sawn and engineered timber products that are referenced in IBC Chapter 23 (Wood) and in PRG-320 “Standard for Performance-rated Cross-laminated Timber.”

“Noncombustible Protection (For Mass Timber): The definition of “Noncombustible Protection (For Mass Timber)” is

created to address the passive fire protection of mass timber. Mass timber is permitted to have its own fire-resistance rating (e.g., Mass Timber only) or have a fire resistance rating based on the fire resistance through a combination of the mass timber fire-resistance plus protection by non-combustible materials as defined in Section 703.5 (e.g., additional materials that delay the combustion of mass timber, such as gypsum board). While it is not common to list a code section number within a definition it was felt necessary in this case to ensure that the user was able to understand the intent. The protection by a non-combustible material will act to delay the combustion of the Mass Timber.

Types of Construction

The Committee recognized that tall, mass timber buildings around the world generally fell into three categories: one in which the mass timber was fully protected by noncombustible protection, a second type in which the protection was permitted to be omitted to expose the wood in certain limited amounts of walls or ceilings, and a third type in which the mass timber for the structure was permitted to be unprotected.

The TWB also determined that fire testing was necessary to validate these concepts. At its first meeting, members discussed the nature and intention of fire testing so as to ensure meaningful results for the TWB and, more specifically, for the fire service. Subsequently a test plan was developed. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stairway. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of joints, and to evaluate conditions for responding fire personnel. The Fire WG then refined the test plan, which was implemented with a series of five, full-scale, multiple-story building tests at the Alcohol, Tobacco and Firearms (ATF) laboratories in Beltsville, MD. The results of those tests, as well as testing conducted by others, helped form the basis upon which the Codes WG developed its code change proposals. This code change proposal is one of those developed by the Codes WG and approved by the TWB.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3-1/2 minutes each, please visit: <http://bit.ly/ATF-firetestvideos>.

Both of these links were confirmed active on 12/27/17.

The completely protected type of construction, as noted above, is identified as Type IV-A. The protection is defined by a new section, 722.7, proposed in a separate code change. Testing has shown that mass timber construction protected with noncombustible protection, primarily multiple layers of 5/8-inch Type X gypsum board, can survive a complete burnout of a residential fuel load without engaging the mass timber in the fire. (See video or report above.) In considering this type of construction and its potential height and/or allowable area, the TWB wanted to make sure that code users realize that the protection specified in the text applies to all building elements. Thus, the text clearly requires protection for the floor surface, all wall and ceiling surfaces, the inside roof surfaces, the underside of floor surfaces, and shafts. In addition, Type IV-A construction is proposed to have the same fire resistance rating requirements as the existing Type I-A construction, which sets forth requirements for 2-hour and 3-hour structural elements. The specified fire resistance rating for Type IV-A construction is conservative in that the fire resistance rating of the structural elements was selected to be able to passively sustain the fuel loads associated with the various occupancies without the benefit of automatic sprinkler protection, and without involving the contribution of the structural members, similar to the strategy employed in the IBC for Type I construction.

Type IV-B allows some exposed wood surfaces of the ceiling, the walls or columns and beams. The amount of exposed surface permitted to be installed, as well as the required separation between unprotected portions, is clearly specified to limit the contribution of the structure in an interior fire. For example, two different walls may share the unprotected area but the two walls must be separated by a distance of 15 feet. Type IV-B has been subjected to the same fire tests under the same conditions as Type IV-A and the results demonstrate that a predictable char layer develops on mass timber in the same fashion as traditional sawn lumber, provided that substantial delamination is avoided. (See video or report above.) It should be noted that, while portions of the mass timber may be unprotected, concealed spaces, shafts and other specified areas are required to be fully protected by noncombustible protection. Type IV-B is provided with the same base fire resistance requirements as the existing Type I-B construction, which sets forth requirements for 2-hour structural elements. Please note that the allowance per IBC Section 403.2.1.1 to reduce I-B construction to 1-hour structural elements is not proposed for Type IV-B construction. Essentially, where a building is permitted to be constructed of I-B construction and has 1-hour protection, that same building will still require 2-hour structural elements for Type IV-B construction.

Type IV-C construction permits fully exposed mass timber. Important caveats are that concealed spaces, shafts, elevator hoistways, and interior exit stairway enclosures are not permitted to be exposed, but instead are required to have noncombustible protection. The IV-C construction is differentiated from traditional Heavy Timber construction in that Type IV-C construction is required to be 2-hour fire rated. While the added fire rating is required, the committee

does not propose any additional height, in terms of feet, for Type IV-C buildings; in other words, the height in feet for Type IV-C and Type IV-HT are identical. However, due to the added fire resistance ratings, the committee has proposed added floors for some occupancy groups of Type IV-C construction.

Tables 601 and 602: Included in the proposal are modification of Tables 601 and 602. This is necessary to set the performance requirement for these new types of construction based upon mass timber. It should be noted that these Fire Resistance Ratings are set to have the requirements similar to those of Type I construction. In other words, IV-A has the same FRR as I-A; IV-B has the same FRR as I-B. Because there is no Type I corollary to IV-C, it was set the same as IV-B. The IV-C has to achieve all its fire resistance by the performance of the mass timber itself because no noncombustible protection is required. This is reflected in greatly reduced permitted height, in both feet and stories, in other TWB proposals to Table 504.3, 504.4 and 506.2.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Analysis: The standards referenced in the changes in this proposal, DOC PS1, ASTM E1354, ASTM E84 and UL 723, are already referenced in the International Codes.

Internal ID: 852

G109-18

IBC: 602.4, 602.4.3 (New), 2304.11.3, 2304.11.4

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

2018 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated wood, heavy timber (HT) or structural composite lumber (SCL) without concealed spaces, spaces or with concealed spaces complying with Section 602.4.3. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL), and cross-laminated timber and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.1 or 602.4.2 shall be permitted. Interior walls and partitions not less than 1-hour fire-resistance rating-rated or heavy timber complying with Section 2304.11.2.2 shall be permitted.

602.4.1 Fire-retardant-treated wood in exterior walls. *Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.

602.4.2 Cross-laminated timber in exterior walls. *Cross-laminated timber* complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

1. *Fire-retardant-treated wood* sheathing complying with Section 2303.2 and not less than $15/32$ inch (12 mm) thick;
2. *Gypsum board* not less than $1/2$ inch (12.7 mm) thick; or
3. A noncombustible material.

Add new text as follows:

602.4.3 Concealed spaces. Concealed spaces shall not contain combustible materials other than building elements and electrical, mechanical, fire protection, or plumbing materials and equipment. Concealed spaces shall comply with applicable provisions of Section 718. Concealed spaces shall be protected in accordance with one or more of the following:

1. The building shall be sprinklered throughout in accordance with Section 903.3.1.1 and automatic sprinklers shall also be provided in the concealed space.
2. The concealed space shall be completely filled with noncombustible insulation.
3. Surfaces within the concealed space shall be fully sheathed with not less than 5/8 inch Type X gypsum board.

Exception: Concealed spaces within interior walls and partitions with a one hour or greater fire resistance rating complying Section 2304.11.2.2 shall not require additional protection.

Revise as follows:

2304.11.3 Floors. Floors shall be without concealed spaces, spaces or with concealed spaces complying with Section 602.4.3. Wood floors shall be constructed in accordance with Section 2304.11.3.1 or 2304.11.3.2.

2304.11.4 Roof decks. Roofs shall be without concealed spaces and roof or with concealed spaces complying with Section 602.4.3. Roof decks shall be constructed in accordance with Section 2304.11.4.1 or 2304.11.4.2. Other types of decking shall be an alternative that provides equivalent fire resistance and structural properties. Where supported by a wall, roof decks shall be anchored to walls to resist forces determined in accordance with Chapter 16. Such anchors shall consist of steel bolts, lags, screws or *approved* hardware of sufficient strength to resist prescribed forces.

Reason:

The option of having protected concealed spaces in Type IV buildings is important to encourage the adaptive re-use of existing heavy timber buildings as well as to provide for the installation of mechanicals in Type IV cross laminated timber (CLT) construction. In addition to the current requirements for all concealed spaces in combustible construction, this change would require additional protection of the concealed spaces with sprinkler coverage, or eliminating all air space with noncombustible insulation, or covering all combustible surfaces with gypsum. These alternatives are the same protection required for concealed spaces in NFPA 13, except they are slightly more restrictive since 5/8-inch Type X gypsum is required in the one case. In addition, because the provisions are taken from NFPA 13, in order to use these provisions, the entire building must be protected by a sprinkler system complying with NFPA 13.

A similar change was recently successful in NFPA 220 and NFPA 5000. This proposal is more conservative in that it requires 5/8-inch Type X gypsum instead of 1/2 -inch gypsum in the alternative for sheathing combustible concealed spaces with gypsum in proposed section 602.4.3.

The change from “rating” to “rated” in Section 602.4 is editorial for good grammar.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Will not increase the cost of construction. The code change provides the option of having protected concealed spaces in Type IV HT buildings, therefore does not increase the cost of construction.

Internal ID: 1706

G110-18

IBC: 602.4.1, 602.4.2

Proponent: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org); Sam Francis, representing American Wood Council (sfrancis@awc.org)

2018 International Building Code

Revise as follows:

602.4.1 Fire-retardant-treated wood in exterior walls. *Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies ~~not less than 6 inches (152 mm) in thickness~~ with a 2-hour rating or less.

602.4.2 Cross-laminated timber in exterior walls. *Cross-laminated timber* ~~not less than 4 inches (102 mm) in thickness~~ complying with Section 2303.1.4 shall be permitted within exterior wall assemblies ~~not less than 6 inches (152 mm) in thickness~~ with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one the following:

1. *Fire-retardant-treated wood* sheathing complying with Section 2303.2 and not less than $1\frac{5}{32}$ inch (12 mm) thick;
2. *Gypsum board* not less than $\frac{1}{2}$ inch (12.7 mm) thick; or
3. A noncombustible material.

Reason:

This code change corrects a correlation issue that was the result of two conflicting code changes that were both approved in the last cycle.

Code change 184-15, Approved as Submitted, eliminated the minimum thickness dimension of the exterior wall assembly for both Cross Laminated Timber (CLT) and Fire Retardant Treated Wood (FRTW) exterior walls, and introduced a minimum thickness for the CLT itself. G179-15, also Approved as Submitted, re-introduced the minimum wall assembly thickness into these sections in order to provide a re-organization of provisions without making any technical changes to the existing requirements. Correlation was made in favor of G179-15, having the effect of nullifying the action of G184-15, which was not anticipated.

The previous action on G184-15 should be affirmed by approval of this proposal for the same reasons it was originally approved: a minimum thickness for the CLT is a better parameter for structural integrity than an overall thickness of wall, since overall thickness could include exterior sheathing, cladding, and exterior insulation. This proposal will provide the thickness required for the CLT. In regard to FRTW exterior walls, the thickness of the assembly is not a significant factor, rather the required fire resistance rating is. A minimum thickness for the entire exterior wall assembly is unnecessary.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a correlation issue regarding two separate proposals Approved as Submitted. There are no technical changes that were not already approved in 2015.

Internal ID: 722

G111-18

IBC: 602.4.2

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

2018 International Building Code

Revise as follows:

602.4.2 Cross-laminated timber in exterior walls. *Cross-laminated timber* complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or ~~less; provided the less.~~ ~~Heavy timber structural members appurtenant to the CLT exterior wall shall meet the requirements of Table 2304.11 and be fire-resistance rated as required for the exterior wall. The exterior surface of the cross-laminated timber is timber and heavy timber elements shall be protected by one the following:~~

1. *Fire-retardant-treated wood* sheathing complying with Section 2303.2 and not less than $1\frac{5}{32}$ inch (12 mm) thick;
2. *Gypsum board* not less than $\frac{1}{2}$ inch (12.7 mm) thick; or
3. A noncombustible material.

Reason:

The code currently does not recognize that heavy timber members could be used as a beam, header, column or other boundary element within a wall of CLT. Glued laminated, SCL, or solid sawn heavy timber elements having the same rating, thickness, and protection as required for the CLT will have no significant difference in fire performance. This is a common sense approach to the current code, but should be made explicit.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change clarifies that additional heavy timber elements may be required as part of a CLT wall and they are permitted as part of the solid timber built up assembly. This clarifies the application of existing language and neither increases or decreases the cost of construction. It merely clarifies options that are currently used under common sense interpretation by the code official.

Internal ID: 1786

G112-18

IBC: 603.1

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:
 - 1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or ~~less-less~~ except in shaft enclosures within Group I-2 and ambulatory care facilities.
 - 1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
 - 1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

Exceptions:

 1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
 2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason:

This new language is required in order to conform with Federal Standards and CMS enforcement rules (K163). Fire-retardant (FRT) wood has previously not been considered equivalent to a non-combustible material, however codes have recently changed to permit FRT in certain locations. Centers for Medicaid and Medicare Services does not accept this material in shaft construction.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal will increase cost based on the replacement of fire retardant treated (FRT) wood with metal studs or other construction. However, it does not add cost to the healthcare industry because certified facilities already follow these requirements in the context of the CMS federal standards.

Internal ID: 579

G113-18

IBC: 603.1

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:
 - 1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.
 - 1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception-Exceptions:

1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
 2. Group I-2, combustible roof construction shall be covered by minimum of a Class A roof covering or roof assembly, and shall be separated from the story below by a horizontal assembly with a fire-resistance rating of not less than 2 hours.
- 1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

Exceptions:

 1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
 2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.

16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason:

This proposal creates conformance with more restrictive federal certification requirements (K162). The goal here is to create a complete two hour assembly below the lowest combustible member. This creates added layers of protection for protect in place environment from fires originating in mechanical equipment, embers from adjacent fires, etc.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal will increase cost based on the added 2-hour horizontal separation and potentially higher roof cover rating. However, it does not add cost to the healthcare industry because certified facilities already follow these requirements in the context of the CMS federal standards.

Internal ID: 575

G114-18

IBC: 603.1

Proponent: Carl Martin, representing self (carl.martin@ncdoi.gov)

2018 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:
 - 1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.
 - 1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
 - 1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

Exceptions:

 1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
 2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. 27.
27. Wood nailers for parapet flashing and roof cants.

Reason:

Wood nailers used for roof parapets and cants are necessary for properly fastening roof materials and does not provide a significant amount of combustible material to the construction type.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change addresses common construction practice.

Internal ID: 570

G115-18

IBC: 603.1

Proponent: Misty Guard, Bradley Corporation, representing Bradley Corporation

2018 International Building Code

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:
 - 1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.
 - 1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
 - 1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

Exceptions:

 1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
 2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m²), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Toilet and urinal partitions installed in accordance with Section 1209.
28. Combustible lockers complying with Section 808.4 of the International Fire Code.

Reason:

Section 603.1 attempts to list all of the combustible materials installed in noncombustible buildings. However, there are two items not currently listed that are permitted by the code, partitions for plumbing fixtures and lockers. Both items are available in both combustible and noncombustible materials. Combustible partitions and lockers are currently permitted in the Building Code and Fire Code.

The proposed text will add reference to the appropriate sections of code. Toilet and urinal partitions are regulated by Section 1209. Lockers are listed in Section 808.4 of the International Fire Code.

This change will clarify the acceptance of combustible toilet and urinal partitions and lockers in noncombustible buildings.

Bibliography:

Ahrens, M. (2017). Non-Residential Structure Fires that Originated in Lavatories, Locker Rooms or Coat Check Rooms. Quincy, MA: NFPA Research.

<https://www.dropbox.com/sh/0e177098908o5up/AADoei27Mnp3XfjaA9rreawQa?dl=0> Established 1.24.18

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Internal ID: 1850

G116-18 Part I

IBC: 1202.1, 1202.1.1 (New), 1202.1.2 (New)

Proponent: Keith Flanders, Cosentini Associates, representing self (kflanders@cosentini.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE GENERAL CODE DEVELOPMENT COMMITTEE. PART II WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Building Code

Revise as follows:

1202.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1202.5, or mechanical ventilation in accordance with the International Mechanical Code. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour where tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code Residential Provisions, the dwelling unit~~ Dwelling units shall be ventilated ~~by mechanical means in accordance with Section 403 of the International Mechanical Code.~~ in accordance with Section 1202.1.1 or Section 1202.1.2. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the International Mechanical Code.

Add new text as follows:

1202.1.1 Natural Ventilation. Dwelling units provided with natural ventilation in accordance with Section 1202.5 shall have an air infiltration rate of not less than 5 air changes per hour. The air infiltration rate shall be tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code.

1202.1.2 Mechanical Ventilation. Dwelling units provided with mechanical ventilation shall be in accordance with Section 403 of the International Mechanical Code.

Internal ID: 1042

G116-18 Part II

IMC: 401.2, 401.2.1 (New), 401.2.2 (New)

Proponent: Keith Flanders, Cosentini Associates, representing self (kflanders@cosentini.com)

2018 International Mechanical Code

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.~~ Dwelling units shall be ventilated in accordance with the ventilation method specified in Section 401.2.1 or 401.2.2. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

Add new text as follows:

401.2.1 Natural Ventilation. Dwelling units shall be provided with natural ventilation in accordance with Section 402 and shall have an air infiltration rate of not less than 5 air changes per hour. The air infiltration rate shall be tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code.

401.2.2 Mechanical Ventilation. Dwelling units shall be provided with mechanical ventilation in accordance with Section 403.

Reason:

The provisions for ventilation from dwelling units has been modified in recent editions of the code creating unnecessary confusion among the building industry. Accordingly, this proposal seeks to clarify the requirements.

It is understood the intent is that all dwelling units must have mechanical ventilation unless they can meet the blower door test requirements of the IECC. This is not always how this section has been interpreted and therefore this proposal is sought as a clarification. See attached previous code change proposal for the original intent. Additionally, the 2012 IBC Significant Code Change documentation regarding the subject matter. Both attachments substantiate that the provisions are intended to apply to all dwelling units, not just dwelling units in residential buildings (3 stories or less) as defined by the IECC.

Also note that a formal interpretation regarding this matter was requested; however, it remained unresolved. See attached comments regarding the request.

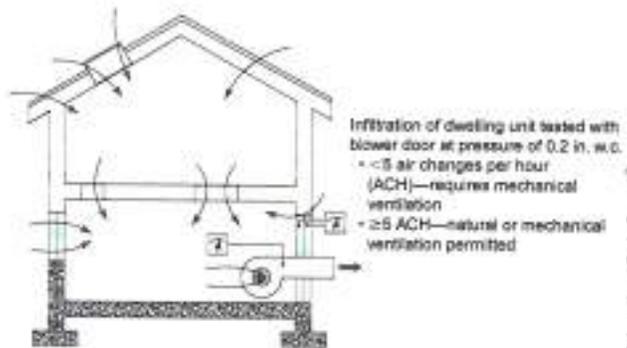
1203.1**Mechanical Ventilation Required****CHANGE TYPE:** Addition

CHANGE SUMMARY: The option of natural ventilation rather than mechanical ventilation is now unavailable when a dwelling unit is tested using a blower door test and it is determined that an adequate number of air changes are not provided.

2012 CODE: 1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.

CHANGE SIGNIFICANCE: As the building's thermal envelope gets tighter resulting in less outdoor air leaking into the building's interior, mechanical ventilation may be necessary to maintain the indoor air quality. For dwelling units, a measured cutoff point is provided and a reference is made to the applicable provisions of the *International Mechanical Code* for providing the necessary ventilation. It should be noted that the new text in the IBC does not require that a blower door test be conducted, but rather, acts on the results of any such test that is conducted. However, code users should be aware that Section 402.4.1.2 of the 2012 *International Energy Conservation Code* (IECC) does require that residential buildings conduct a blower door test to determine the amount of air leakage. Therefore, in jurisdictions that have adopted the IECC those blower door test results will be used to determine if the IBC requirement for a mechanical ventilation system is to be imposed. Because the IECC requires a maximum air leakage rate of 5 air changes per hour, any building other than those in Climate Zones 1 and 2 that have exactly 5 air changes per hour would need a mechanical ventilation system based on IBC Section 1203.1.



Blower door test determines air infiltration rate

Generally, the designer has a choice of either providing natural ventilation or mechanical ventilation. The option of using natural ventilation instead of mechanical ventilation is no longer permitted when the dwelling unit is tested using the blower door test and the infiltration level is below 5 air changes per hour (ACH). As building construction practices have improved, buildings have become tighter; as buildings become tighter, mechanical ventilation must be introduced to provide sufficient levels of ventilation to ensure indoor air quality. This 5-air-change requirement at the specified pressure provides a clear point to determine when infiltration is not adequate and must be supplemented by a mechanical system.

The 5 ACH limit was selected even though it is less than would generally be obtained by the IMC's requirement for 0.35 ACH of outdoor airflow for a dwelling using a mechanical ventilation system. By following the calculation procedures of the ASHRAE 136 standard, it can be shown that a natural infiltration rate of 0.35 ACH is equivalent to somewhere between 7 to 10 ACH at the specified pressure, depending on the local climatic conditions of the building. As fewer air changes are provided, the reliance on window operation is not sufficient and the concern for the effect on indoor air quality goes up. An additional source of justification for the 5 ACH limit is the National Association of Home Builder's (NAHB's) *National Green Building Standard* that requires whole-house mechanical ventilation when the infiltration rate falls below the 5 ACH value.

The actual effect of this change may be less than what it would first appear because most dwelling units do provide a mechanical ventilation system and do not rely on natural ventilation. If the dwelling unit is using a mechanical system, the IMC requires the necessary 0.35 ACH of outdoor airflow which is adequate for providing the proper ventilation.

Bibliography:

Significant Changes to the International Building Code, 2012 edition; Page 212

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a clarification and not a change, therefore, it will not increase nor decrease the cost of construction.

Internal ID: 3418

G117-18

IBC: 1202.1

Proponent: Daniel buck, JRS Engineering, representing Air Barrier Association of America (dbuck@jrseengineering.com)

2018 International Building Code

Revise as follows:

1202.1 General. Buildings shall be provided with natural ventilation in accordance with the International Mechanical Code.

~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour where tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code - Residential Provisions, the *dwelling unit*~~*Dwelling units* shall be ventilated by mechanical means in accordance with Section 403 of the International Mechanical Code. *Ambulatory care facilities* and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the International Mechanical Code.

Reason:

This change clarifies the implications of the existing code language. Under current code, Dwelling Units in multi-unit buildings, to which this commercial code would apply, are not required to be tested in accord with the referenced Section R402.4.1.2 of the International Energy Conservation Code - Residential Provisions. It is therefore impossible for design professionals or code officials to determine if the Dwelling Unit must be vented mechanically, unless additional voluntary testing is conducted. This testing also comes after construction is completed and adding additional mechanical ventilation at that phase could be very costly. However, if dwelling units are required to be tested in accord with section R402.4.1.2, they must have a resulting air infiltration rate of less than 5 air changes per hour. Therefore, the existing code language requirement for mechanical ventilation applies to all Dwelling Units that would meet the residential code. Eliminating this language all together would preserve the effect of the code, while clarifying the intent, and eliminating the reference to testing which is not required.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

For jurisdictions that adopt both the IBC and IECC, there will be no cost impact from this proposed change to existing code provisions.

Internal ID: 1570

G118-18

IBC: 202 (New), 1202.3

Proponent: Mike Fischer, Kellen Company, representing The Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

2018 International Building Code

Add new definition as follows:

VAPOR DIFFUSION PORT.

An assembly constructed or installed within a roof assembly at an opening in the roof deck to convey water vapor from an unvented attic to the outside atmosphere.

Revise as follows:

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

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a 1/4-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. ~~Insulation shall be located in accordance with the following~~comply with 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 where air-permeable insulation is installed in unvented attics it shall meet the following requirements: 1) An approved vapor diffusion port shall be installed not more than 12 inches (305mm) from the highest point of the roof, measured within the plane of the roof from the highest point of the roof to the lower edge of the port. 2) The port area shall be ≥ 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. The ports

shall be distributed equally throughout the attic space. 3) The vapor diffusion port shall include an approved vapor permeable and water-resistive membrane that is open to the outside air. The vapor permeable membrane in the vapor diffusion port shall have a vapor permeance rating of ≥ 20 perms when tested in accordance with Procedure A of ASTM E96. 4) The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building. 5) The vapor diffusion port shall protect the attic against the entrance of rain and snow. 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. 7) The roof slope shall be $\geq 3:12$ (vertical/horizontal). 8) Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing. 9) Air-impermeable insulation, if any, shall be directly above or below the structural roof sheathing and is not required to meet the R-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the air-impermeable and air-permeable insulation. 10) The air shall be supplied at a flow rate ≥ 50 CFM (23.6 L/s) per 1000 square foot of ceiling. 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.

5.3. Where preformed insulation board is used as the *air-impermeable insulation* layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

Reason:

This proposal is the same as PC1 to RB 327-16, which was approved as submitted for the IRC. ARMA is concerned with the lack of detail regarding the vapor diffusion port in the IRC, and submitted this proposal to provide an option to improve the language for inclusion in the IBC with the thought to modify the IRC during group B. The risk of moisture damage to the roof deck, and subsequent issues with roof covering attachment should be addressed.

The proposal differs from the IRC as follows:

1. Modifies the definition of vapor diffusion port to clarify that it is an element of the attic space and is installed within the roof deck.
2. Provides guidance on the location of the vapor diffusion ports within the roof assembly.
3. States clearly that the vapor diffusion port contains a membrane material that is both vapor permeable and water resistive.

These modifications are consistent with the research report used as justification for the IRC provisions for air-permeable insulation in unvented attics. Without this change, the provisions lack appropriate detail to ensure proper performance.

Cost Impact

The code change proposal will decrease the cost of construction .

The proposal adds an optional insulation strategy to the IBC; it does not add any mandatory provisions.

Analysis: The standard referenced in this proposal, ASTM E96, is already referenced in the IBC.

Internal ID: 2390

G119-18

IBC: 202 (New), 1202.3

Proponent: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingsscience.com)

2018 International Building Code

Add new definition as follows:

VAPOR DIFFUSION PORT. An assembly constructed or installed within a roof assembly at an opening in the roof deck to convey water vapor from an unvented attic to the outside atmosphere.

Revise as follows:

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

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a 1/4-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. ~~Insulation shall be located in accordance with the following:~~ 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 (305mm) 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 \geq 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 ≥ 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 $\geq 3:12$ (vertical/horizontal).
 - 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 ≥ 50 CFM (23.6 L/s) per 1000 ft² of ceiling.
- 5.3. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. Where preformed insulation board is used as the *air-impermeable insulation* layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

Reason:

Unvented attic assemblies have a record of success. Airtight attics also benefit energy efficiency. Unvented attic assemblies are most commonly constructed with spray polyurethane foam applied directly to the underside of the roof deck. This is a historically successful method of construction with over 20 years of experience. Another approach to unvented attic assemblies is to insulate over the top of the roof deck with rigid insulation boards.

The proposed code change allows the use of lower cost alternatives. Specifically, the proposed code change allows the use of blown cellulose, fiberglass batts, and blown fiberglass to construct unvented attic assemblies. The approach is limited to Climate Zones 1, 2 and 3 based on research and historic experience over the past decade. The proposed code change adds a vapor diffusion port/vent. The port acts as a moisture control measure, allowing moisture in the attic to be removed by vapor diffusion rather than by air change. This allows the attic assembly to remain airtight while providing a path for vapor moisture via vapor diffusion.

This allows alternatives to rigid board and spray polyurethane foam. Alternatives provides more material choices for designers, builders and consumers and may provide less expensive options for unvented attics. This same change was approved for the IRC last code cycle. This also allows insulation to be above the ceiling or on the attic floor. With air permeable insulation the insulation can be installed directly to the underside of the roof deck or at the floor or ceiling level of an attic assembly as moisture laden air is more buoyant than dry air and therefore the moisture will accumulate at the ridge and exit via the vapor diffusion port.

This proposal improves upon the 2018 IRC text by adding additional detail on the vapor diffusion port, consistent with the research used as substantiation for the original IRC code change. It modifies the definition of vapor diffusion port to clarify that it is an element of the attic space and is installed within the roof deck. It also provides guidance on the location of the vapor diffusion ports within the roof assembly, and clarifies that the vapor diffusion port contains a membrane material that is both vapor permeable and water resistive.

Adding new unvented attic options to the existing options provides additional benefits. In high wildfire regions the elimination of eave vents and air sealing the upper attic vents at ridges reduces the entry of embers. In hurricane zones the elimination of roof vents reduces the entry of rainwater during hurricane events.

The research work supporting this code change is an outgrowth of the original research work supporting unvented attic assemblies started in 1995 under the Department of Energy's Building America Program. The same technical team and the same technical rigor that supported the original code changes for unvented attics in the early 2000's are behind this proposed code change.

The technical rationale and research behind this code change can be found at Venting Vapor:

<http://buildingscience.com/documents/insights/bsi-088-venting-vapor?topic=doctypes/insights>

For a history of conditioned attics, see Cool Hand Luke Meets Attics

<http://buildingscience.com/documents/insights/bsi-077-cool-hand-luke-meets-attics>

Additional technical data can be found at:

<https://buildingscience.com/documents/building-america-reports/ba-1511-fieldtesting-unvented-roof-fibrous-insulation-tiles-and>

And:

<https://buildingscience.com/documents/building-america-reports/ba-1409-field-testing-unvented-roofs-asphalt-shingles-cold-and>

Links to two full research reports are at the bottom of the pages on the web sites.

Cost Impact

The code change proposal will decrease the cost of construction .

This provides a new option for using additional insulation materials. In some cases those materials would reduce costs.

Analysis: The standard referenced in this proposal, ASTM E96, is already referenced in the IBC.

Internal ID: 1185

G120-18

IBC: SECTION 202, 202 (New), 1202.3

Proponent: Charles Haack, representing North American Insulation Manufacturers Association (chaack@naima.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new text as follows:

VAPOR DIFFUSION PORT. A passageway for conveying water vapor from an unvented attic to the outside atmosphere.

Revise as follows:

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

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a 1/4-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Insulation shall ~~be located in accordance with the following~~ comply with Item 5.3 and either Item 5.1 or 5.2:
 - 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. An approved 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 (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within the space.
- 5.2.7. The roof slope shall be greater than or equal to 3:12 (vertical/horizontal).
- 5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing.
- 5.2.9. Air-impermeable insulation, if any, shall be directly above or below the structural roof sheathing and is not required to meet the R-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the air-impermeable insulation and air-permeable insulation.
- 5.2.10. The air shall be supplied at a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 m²) of ceiling. 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.

- 5.3. Where preformed insulation board is used as the *air-impermeable insulation* layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.



Reason:

This exact code change has been approved and included in the 2018 International Residential Code and this proposal extends the same language to the International Building Code.

This proposal would expand the ability to use air-permeable insulation materials in Climate Zones 1, 2, and 3 supported by research and field testing during the past 10 years. The proposed code change allows the use of lower cost alternatives, including permitting the use of fiber glass, rock wool, or cellulose to construct unvented attic assemblies.

Unvented attic assemblies already have a record of success and unvented attic assemblies are most commonly constructed with spray polyurethane foam applied directly to the underside of the roof deck. This method of construction has over 20 years of documented successful implementation and experience. Another, but less common, approach to unvented attic assemblies is to insulate over the top of the roof deck with rigid insulation boards.

Unvented assemblies offer several benefits to builders and homebuyers including increased home energy efficiency, lower cost alternatives, and design flexibility. Unvented attic assemblies can reduce energy costs for homes with HVAC systems located in the attic by lowering the temperature of the air surrounding the system and reducing the loss of conditioned air to areas outside the conditioned space. Expanding the ability to use other materials including fiber glass, rock wool, and cellulose will increase competition and likely lower construction costs for unvented attic assemblies.

This proposed code change adds a vapor diffusion port/vent to the roof system. The port acts as a moisture control

measure, allowing moisture in the attic to be removed by vapor diffusion rather than by air change. This allows the attic assembly to remain airtight while providing a path for vapor moisture via vapor diffusion.

Adding new unvented attic options to the existing options provides additional benefits. In high wildfire regions, the elimination of eave vents and air sealing the upper attic vents at the ridges reduces the entry of embers. In hurricane zones, the elimination of roof vents reduces the entry of rainwater during hurricane events.

The research work supporting this code change is an outgrowth of the original research work supporting unvented attic assemblies started in 1995 under the Department of Energy's Building America program. The same technical team and the same technical rigor that supported the original code changes for unvented attics in the early 2000s are behind this proposed code change.

Bibliography:

Following is a list links to research reports and information for this code proposal: <http://www.buildingscience.com/documents/insights/bsi-088-venting-vapor?topic=doctypes/insights>

For a history of conditioned attics, see "Cool Hand Luke Does Attics": <http://buildingscience.com/documents/insights/bsi-077-cool-hand-luke-meets-attics>

For the technical data see: <http://buildingscience.com/documents/building-america-reports/ba-1409-field-testing-unvented-roofs-asphalt-shingles-cold-and> (NOTE: The link to the research report above is at the lower right of this webpage.)

http://buildingscience.com/sites/default/files/document/ba-1511_field_testing_of_unvented_roof_with_fibrous_insulation_tiles_and_vapor_diffusion_venting.pdf

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will not increase the cost of construction and will provide options to builders and designers.

Analysis: The standard referenced in this proposal, ASTM E96, is already referenced in the IBC.

Internal ID: 1237

G121-18

IBC: 1204.1

Proponent: Peter Valkov, City of Fargo, ND, representing City of Fargo, North Dakota (pvalkov@cityoffargo.com); Christine Rose, City of Fargo, representing City of Fargo (crose@cityoffargo.com)

2018 International Building Code

Revise as follows:

1204.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1204.2 or shall be provided with artificial light in accordance with Section 1204.3. Exterior glazed openings shall open directly onto a *public way* or onto a *yard* or *court* in accordance with Section 1205.

In Group E and I-4 occupancies, rooms intended to be used as classrooms or day care rooms shall be provided with natural light. Artificial light shall not be substituted for such required natural light.

Reason:

I am driven to propose this change on behalf of all little members of our society who cannot propose this change themselves.

Through my profession, I am reviewing many day care and school plans. Every time I see a classroom without windows, every time I see day care using an old building purposed for store or storage and hastily re-purposed for day care without any regard for the need of natural light (and this happens too often), I feel extremely sad. I am also very concerned that we as a society force our kids to places that have no natural light. We force them as they do not have choice, or say, or option to make a decision.

Researching the importance of natural light for the health and the intellectual development in little children gives me hope such a change is more than needed and possible, it is long overdue.

Having discussed my idea with colleagues in the City of Fargo and design professionals from the area also provided me with positive feedback. Architects, I have spoken to, also confirmed this change is possible from a design standpoint and it won't provide burden on the schools and day care facilities alike.

Therefore, today, I state my hope this change is made integral part of the building code as a part of our constant quest for healthier and safer buildings. Buildings that promote better and more natural environment for those amongst us that need it the most!

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14. <https://www.corbettinc.com/blog/2017/4/26/our-top-3-reasons-natural-light-benefits-students-schools>

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The need and requirement for windows is already a part of the International Building Code. Therefore, I do not foresee any changes in construction cost as a result from such a change.

Internal ID: 1578

G122-18

IBC: 1206.1

Proponent: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows:

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas. ~~such as halls, corridors, stairways or service areas.~~

Reason:

There are building designs where a dwelling unit or sleeping unit in a mixed occupancy building may be adjacent to a commercial space where airborne and structure-borne sound is significant and may interrupt the occupants of the dwelling or sleeping unit unless the common interior walls, partitions and floor/ceiling assemblies are designed to limit sound transmissions to an acceptable level. This proposal deletes the examples currently listed at the end of Section 1206.1 which effectively broadens the scope of uses where sound abatement requirements can be enforced and provides the building official with authority to require sound abatement when appropriate. Occupants of the affected dwelling units and sleeping units may not realize that additional sound abatement has been provided but the quality of their lives will improve as a result.

Cost Impact

The code change proposal will increase the cost of construction .

This code change has the potential to increase the cost of construction because there may be a need to provide sound abatement between dwelling units or sleeping units and adjacent public areas.

Internal ID: 86

G123-18

IBC: 1206.2, Chapter 35

Proponent: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2018 International Building Code

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or not less than 45 if field tested ~~, for airborne noise where tested in accordance with ASTM E90.~~ ASTM E336, for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM ~~E90.~~ E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA 19428-
2959
US

E336-17a:

Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings

Reason:

This change clarifies the appropriate ASTM test methods for airborne sound transmission. ASTM E90 is a laboratory measurement, and ASTM E336 is a field test. This proposal clarifies which test method to use.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change simply clarifies which test to use, with no impact on cost.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E336 -17a, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 222

G124-18

IBC: 1206.2

Proponent: Michael Schmeida, Gypsum Association, representing Gypsum Association (mschmeida@gypsum.org)

2018 International Building Code

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50, or not less than 45 if field tested, for airborne noise where tested in accordance with ASTM E90. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by an engineering analysis either conducted or reviewed by an approved acoustical professional based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

Reason:

There are several engineering analysis tools for sound performance on the market. However, if the design professional is unfamiliar with acoustical engineering, they can be very misleading and therefore lead to a building performing under the expected performance levels. And as acoustical considerations are something most design professionals are not very familiar with at this point in time, the opportunity for error is above average. This change is intended to make sure that systems specified using the engineering analysis option are properly scrutinized by experts in acoustics and therefore are most likely going to perform as expected.

Cost Impact

The code change proposal will increase the cost of construction .

The estimated cost impact would be \$500. However, it should be pointed out that the engineering analysis is an option - there are other ways to meet the criteria of this section already mandated by the code where no additional cost would be incurred.

Internal ID: 565

G125-18

IBC: 1206.2, Chapter 35

Proponent: Michael Schmeida, representing Gypsum Association (mschmeida@gypsum.org)

2018 International Building Code

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50, or not less than 45 if field tested, for airborne noise where tested in accordance with ASTM E90. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. Intersections between walls and floors and wall-to-wall intersections shall be sealed or otherwise treated in accordance to ASTM C919. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA 19428-
2959
US

C919-12(2017):

Standard Practice for Use of Sealants in Acoustical Applications

Reason:

This change addresses sound flanking paths not previously addressed, requiring intersections to be sealed. If unsealed, these paths can reduce the effectiveness of walls by at least 5 STC points versus the tested systems. A differential of 3 STC points becomes perceptible by humans and 5 points is the threshold at which it becomes a nuisance. Sound intrusion via these unsealed intersections can cause noticeable deterioration in sound isolation performance.

Nuisance noise has a measurable impact on human health. A report by the World Health Organization on noise effects and morbidity linked "noise annoyance" (as it was called in the report) to increased risk for several health issues including arthritic symptoms, hypertension, and migraines.

The code already contains requirements for sound transmission, but by not addressing intersections, it leaves a sound transmission path which can negate the effects of other measures taken to reduce sound transmission.

The handbook of sound engineers states that "an acoustical sealant is required to caulk all joints of a partition if the highest TL (transmission loss) is to be attained."

This simple and relatively inexpensive step will ensure sound transmission performance in actual installations lives up to the expectations set by laboratory testing.

Bibliography:

WHO LARES Final Report, Noise Effects on Morbidity, Niemann and Maschke, Berlin Center for Public Health

Handbook for Sound Engineers, Jones, D. (2008), pp. 77-78

Noise Control Manual for Residential Buildings, Harris, D.A., (1997), pp. 73-76.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal is estimated to add approximately \$20 per room requiring sealing to construction costs, for sealant and labor.

Analysis: A review of the standard proposed for inclusion in the code, ASTM C919-12(2017), with regard to the ICC

criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 763

G126-18

IBC: 1206.3, Chapter 35

Proponent: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2018 International Building Code

Revise as follows:

1206.3 Structure-borne sound. Floor-ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have an apparent IIC (AIIIC) of not less than 45 if field tested, ~~where tested in accordance with ASTM E492-E1007~~. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM ~~E492-E492~~.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA 19428-
2959
US

E1007-16:

Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures

Reason:

This change clarifies the appropriate ASTM test methods for airborne sound transmission. ASTM E492 is a laboratory measurement, and ASTM E1007 is a field test. This proposal clarifies which test method to use.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change simply clarifies which test to use, with no impact on cost.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E1007-16, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 223

G127-18

IBC: 1207 (New), 1207.1 (New), 1207.2 (New), Chapter 35

Proponent: Dawn Anderson, representing self (gonedawning@yahoo.com); Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); David Collins, representing the American Institute of Architects (dcollins@preview-group.com); Marsha Mazz, representing U.S. Access Board (mazz@Access-Board.gov); Dominic Marinelli, representing United Spinal Association (DMarinelli@accessibility-services.com)

2018 International Building Code

Add new text as follows:

SECTION 1207 ENHANCED CLASSROOM ACOUSTICS

1207.1 General. Enhanced classroom acoustics, where required in this section, shall comply with Section 808 of ICC A117.1.

1207.2 Where required. In Group E occupancies, enhanced classroom acoustics shall be provided in all classrooms with a volume of 20,000 cubic feet or less.

ICC

International Code Council, Inc.
500 New Jersey Ave NW 6th Floor
Washington DC 20001
US

ICC A117.1-092017:

Accessible and Usable Buildings and Facilities

Reason:

This proposal sets up a new section in the Chapter for Interior Environments; next to the section for sound transmission in residential occupancies. This section is proposed here and not in Chapter 11 because of the benefits of these provisions for all young children – thus following the codes history of mainstreaming’ requirements that may be related to accessibility, but apply broadly.

Research shows that good classroom acoustics are essential to support language acquisition and learning for all children, particularly younger children. For children who have hearing loss and those who use cochlear implants there is no substitute for a good acoustic environment. Assistive technologies typically only amplify the teacher and do not amplify discussions among children or between the teacher and individual child. Children with disabilities not related to hearing, such as autism and learning disabilities may be adversely affected by high ambient noise levels. Students that use a different language at home will also be able to listen more closely to fully understand the teacher and benefit from conversation among peers. Teachers report that a good acoustic environment actually assists in controlling the classroom, reducing the need to raise their voices, and promotes more civil behavior among students. Thus, good acoustic and low background noise in a classroom benefits everyone!

The standard size elementary classroom in the United States holds 25 to 30 students. Many states specify the minimum size at 700 sq.ft. – assuming 20 children in a room. The recommended size for a self-contained classroom is 800 to 960 sq.ft. for grade school; 700 to 840 sq.ft. for secondary school. Some researchers recommend up to 54 sq.ft. per child as optimum – 1620 sq.ft. for a 30 child classroom. Classrooms that are used for activities such as band, orchestra, choir or gym are significantly larger. Some lecture rooms in colleges are large enough to accommodate several hundred students.

The new technical criteria for classroom acoustics in the 2017 ICC A117.1 are limited to classrooms with a size under 20,000 cubic feet; assuming a 10 foot ceiling height, classrooms that are 2000 sq.ft. or less. While acoustics may be important to these larger classrooms, the criteria in ICC A117.1 Section 808 are intended to be applicable to standard size self-contained classrooms. This criteria are also not intended to apply to ancillary learning spaces, such as individual tutoring spaces, or other spaces where students may be, such as corridors or cafeterias.

Technical criteria includes a maximum reverberation time – achieved through either a performance or prescriptive method. The criteria also considers other sound sources – ambient sound and sound sources inside and outside the classrooms.

Cost Impact

The code change proposal will increase the cost of construction .

There will be acoustic requirements for classrooms, but not all spaces in new schools. Since this encompasses such a

broad range of options to comply, the cost may be limited to design choices. The work group intends to propose an exception for existing classrooms during Group B cycle.

Analysis: The 2009 edition of the ICC A117.1 standard is referenced in Chapter 35.

Internal ID: 554

G128-18

IBC: 1207.4

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

1207.4 Efficiency dwelling units. An efficiency living unit shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than 220 square feet (20.4 m²) of floor area. ~~An additional 100 square feet (9.3 m²) of floor area shall be provided for each occupant of such unit in excess of two.~~
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Reason:

Since there is no code path that calculates an occupant load exceeding two occupants unless the gross square footage of the efficiency dwelling unit exceeds 400 square feet, this language is not needed or enforceable.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

No cost impact.

Internal ID: 1836

G129-18

IBC: 1207.4

Proponent: Micah Chappell, representing City of Seattle (micah.chappell@seattle.gov)

2018 International Building Code

Revise as follows:

1207.4 Efficiency dwelling units. An efficiency living unit shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than ~~220~~190 square feet (~~20.4~~17.7 m²) of floor area. An additional 100 square feet (9.3 m²) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Reason:

This proposal changes the living room/habitable space requirement of an efficiency dwelling unit to 190 square feet of floor area, so it is aligned and consistent with the requirements of a dwelling unit's net floor area per IBC Section 1207.3.

An efficiency dwelling unit is required to have more habitable space, more amenities, and a limit on occupants without providing additional floor area compared to a dwelling unit, when the only difference is the area configuration. When the occupant load of an efficiency dwelling unit is calculated indicating an excess of two occupants triggering the additional floor area requirement, there are no corresponding requirements for a dwelling unit of smaller square footage to provide additional space.

IBC Unit Standards:

Unit Type	Single Room	Other Habitable Rooms	Natural Light	Cooking	Sanitation Facility	Closet
Dwelling Unit	≥ 120 SF net floor area	≥ 70 SF* net floor area	Yes*	Yes Cooking facility/not defined	Yes	No
Efficiency Dwelling Unit	≥ 220 SF	N/A	Yes*	Yes Kitchen sink, cooking appliance, and refrigeration facilities	Yes required to be separate	Yes

*IBC allows an exception.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will provide a cost benefit by reducing construction expense through allowing smaller square footage standards for efficiency dwelling units.

Internal ID: 1806

G130-18 Part I

IBC: 1207.4

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE GENERAL CODE DEVELOPMENT COMMITTEE. PART II WILL BE HEARD BY THE PROPERTY MAINTENANCE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Building Code

Revise as follows:

1207.4 Efficiency dwelling units. An efficiency ~~living-dwelling~~ unit shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than ~~220-190~~ square feet (~~20.4-17.6~~ m²) of floor area. An additional ~~100-70~~ square feet (~~9.3-6.5~~ m²) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. ~~The~~ For other than Accessible, Type A and Type B dwelling units, the unit shall be provided with a kitchen sink, cooking appliance and ~~refrigeration facilities~~ refrigerator, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Internal ID: 1579

G130-18 Part II

IPMC: 404.6

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Property Maintenance Code

Revise as follows:

404.6 Efficiency unit. Nothing in this section shall prohibit an efficiency ~~living dwelling~~ unit from meeting the following requirements:

1. A unit occupied by not more than one occupant shall have a minimum clear floor area of 120 square feet (11.2 m²). A unit occupied by not more than two *occupants* shall have a minimum clear floor area of ~~220-190~~ square feet (~~20.4-17.6~~ m²). A unit occupied by three *occupants* shall have a minimum clear floor area of ~~320-260~~ square feet (~~29.7-24.1~~ m²). These required areas shall be exclusive of the areas required by Items 2 and 3.
2. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a minimum clear working space of ~~30-40~~ inches (~~762-990~~ mm) in front. Light and *ventilation* conforming to this code shall be provided.

Exception: Dwelling units not required to be Accessible units, Type A units and Type B units shall have a clear working space of not less than 30 inches (762 mm) in front of the kitchen sink, cooking appliance and refrigerator.

3. The unit shall be provided with a separate *bathroom* containing a water closet, lavatory and bathtub or shower.
4. The maximum number of *occupants* shall be three.

Reason:

The market is trending toward smaller living areas in multi-family R-2 structures particularly in urban areas. US Census statistics show that in 2000, app. 46,000 rental units built were less than 1,000 sq.ft. In 2015, 114,000 units and in 2016, 99,000 units were less than 1,000 sq.ft. The Urban Land Institute reported in 2013 that major Municipalities including New York City, San Francisco, Boston, Dallas and Philadelphia are allowing smaller apartments with Seattle and Portland (OR) having no minimum sizes. The proposed reduction allows for a modest decrease (13.6%) in the required living room area and (30%) in the floor area for each occupant of such unit in excess of two. Code Professionals are receiving proposals for dwelling units in R2 structures that are nonconforming with the minimum standards in the IBC.

The Room Area standard for dwelling units in BOCA and SBBC as well as the 2000 edition of IBC required that one room must have a minimum floor area of 150 sq.ft. This was reduced to 120 sq.ft in the 2003 IBC and remains today. The minimum living room area for efficiency units in the 2000 IBC is the same as the 2018 IBC. No reduction has been proposed even though the overall dwelling unit room area standard has been reduced. The proposal complies with the current language in IBC Section 1207.3. which requires that habitable rooms be at least 120 sq.ft.

IBC 1207.4: The change from "living unit" to "dwelling unit" is to use a defined term to describe these efficiency apartments. The change in Item 3 corrects potential existing conflicts with Chapter 10 of ICC A117.1. which requiring a clear working space of 40 inches in front of the kitchen sink, cooking appliance and refrigerator for Accessible, Type A or B units. The change from "refrigeration facilities" to "refrigerator" is to use a more clearly understood term, and eliminate someone believing that another type of fixture, such as a beer cooler, would be sufficient.

IPC 404.6: The changes to the IPC are for coordination with the revisions to the IBC for efficiency apartments.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal could decrease the cost of construction where efficiency apartments are built to the lower minimum sizes required by the text that is proposed.

Internal ID: 3398

G131-18

IBC: SECTION 202, 202 (New), 1207.4

Proponent: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

DWELLING UNIT, EFFICIENCY. A dwelling unit where all permanent provisions for living, sleeping, eating and cooking are contained in a single room.

Revise as follows:

1207.4 Efficiency dwelling units. ~~An efficiency living unit~~ Efficiency dwelling units shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than 220 square feet (20.4 m²) of floor area. An additional 100 square feet (9.3 m²) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Reason:

Efficiency dwelling units are regulated in IBC Section 1207.4. Currently there is no definition of efficiency dwelling unit found in the code which may create inconsistency in the enforcement of these provisions. Many design professionals and building officials have assumed that efficiency dwelling units are studio apartments having only one habitable room, a closet, restroom and facilities for cooking. This code change will provide the needed definition so consistent enforcement and understanding will be achieved. There are no substantive changes proposed other than adding this definition.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Clarrification only; no substantive changes are proposed so cost will remain the same as the current code.

Internal ID: 235

G132-18

IBC: [P]1209.3

Proponent: Gary Schenk, City of SeaTac, WA, representing Washington Association of Building Officials (gschenk@ci.seatac.wa.us); Lee Kranz, City of Bellevue, representing Washington Association of Building Officials Technical Code Development Committee (LKranz@bellevuewa.gov)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL PLUMBING CODE COMMITTEE. SEE THE IPC-IPSDC HEARING ORDER.

2018 International Building Code

Revise as follows:

[P] 1209.3 Privacy. Public restrooms shall be visually screened from outside entry or exit doorways to ensure user privacy within the restroom. This provision shall also apply where mirrors would compromise personal privacy. Privacy at water closets and urinals shall be provided in accordance with Sections 1209.3.1 and 1209.3.2.

Exception: Visual screening shall not be required for single-occupant toilet rooms with a lockable door.

Reason:

Although this section currently has provisions for sidewall or partition urinal privacy within the restrooms, it does not address privacy from viewing the user at the fixture from outside of the restroom. It also addresses the placement of mirror reflection from the outside.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This would be a design feature and would not increase the cost of construction. Minimal design should be necessary.

Internal ID: 1961

G133-18

IBC: 1209.3.1, 1209.3.1.1 (New)

Proponent: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (Eirene.Knott@brrarch.com)

2018 International Building Code

[P] 1209.3.1 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 occupancy housing areas.

Add new text as follows:

1209.3.1.1 Water closet compartment size. Where a compartment is provided, the compartment shall be not less than 30 inches (762 mm) in width and not less than 60 inches (1524 mm) in depth for floor-mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422) in depth for wall-hung water closets. The compartment shall provide not less than 21 inches (533 mm) of clearance in front of the water closet to any wall, fixture or door.

Reason:

This proposal is bringing language from the IPC into the IBC where designers that utilize the IBC can find this information more readily. Most architectural firms do not have an IPC in their office, but rather rely upon the IBC to provide the information needed for the design aspect of the project. This code change brings language directly from the IPC with specifics that will be utilized by a designer so that the toilet room layout will comply with the requirements of the IPC.

There is specific information in the IBC on the requirements for urinal partitions, so bringing language in specific to the toilet partitions would be a natural supplement to the information already provided

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is just adding language that already exists in the IPC so this will not impact the construction cost.

Analysis: This is a [P] controlled section. This is a matter of IBC-G Committee deciding whether it is appropriate to have the same language contained in the IPC placed in the IBC. Technical changes to this section should not be made by IBC-G.

Internal ID: 490

G134-18

IBC: 1209.3.1

Proponent: Todd Snider, West Coast Code Consultants (WC3), representing Self (Todd@KimballEng.com)

THIS PROPOSAL WILL BE HEARD BY THE INTERNATIONAL PLUMBING CODE COMMITTEE. SEE THE IPC-IPSDC HEARING ORDER.

2018 International Building Code

[P] 1209.3.1 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. The walls or partitions shall begin at a height not more than 12 inches from and extend not less than 72 inches above the finished floor surface.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 occupancy housing areas.

Reason:

Proposed revision to clarify privacy requirements for water closet compartment walls. Urinal partition walls have minimum dimensions but no dimensions have been provided for water closet partitions. This proposes to add requirements which will mirror the requirements for urinal partitions.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This new requirement should not add cost. It seems that often this requirement is followed, but seems important to add as a requirement.

Internal ID: 1302

G135-18

IBC: Chapter 12, 1201.1, SECTION 1210 (New), 1210.1 (New), 1210.2 (New), 1210.2.1 (New), 1210.2.2 (New), 1210.2.3 (New), 1210.2.4 (New), 1210.2.5 (New), 1210.2.6 (New), 1210.2.7 (New), 1210.2.8 (New), 2010.2.9 (New), 1210.2.10 (New), 1210.2.11 (New), 1210.3 (New), 1210.3.1 (New), 1210.3.2 (New), 1210.3.3 (New), 1210.3.4 (New), 1210.3.5 (New), TABLE 1210.3 (New), 1210.3.6 (New), 1210.3.7 (New)

Proponent: Craig Conner, representing self (craig.conner@mac.com); Jani Palmer, representing Environmental Protection Agency (Palmer.Janise@epa.gov)

2018 International Building Code

CHAPTER 12 INTERIOR ENVIRONMENT

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials ~~and~~, rodentproofing associated with the interior spaces of ~~buildings~~buildings, and radon.

Add new text as follows:

SECTION 1210 RADON

1210.1 Applicability. Section 1210 shall apply to use groups E and I located in radon zone 1 as defined in IRC Table AF101(1).

Exception:Compliance with Section 1210 shall not be required where the authority having jurisdiction has defined the radon zone as Zone 2 or 3.

1210.2 Radon testing. Radon testing shall be performed in accordance with Sections 1210.2.1 through 1210.2.11.

1210.2.1 Airtightness. Testing shall be performed after the building passes its airtightness test.

1210.2.2 Fan. Where the system includes a fan, testing shall be performed after the radon control system installation is complete and operating with the fan.

1210.2.3 Lowest level. Testing shall be performed at the lowest level that will be occupied, inclusive of unfinished spaces. Spaces that are physically separated and severed by different HVAC systems shall be tested separately.

1210.2.4 Spaces not tested. Testing shall not be performed in a closet, hallway, stairway, laundry room, furnace room, bathroom or kitchen.

1210.2.5 Test kits and monitors. Testing shall be performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing with test kits shall include two tests, which shall be averaged. Testing shall be in accordance with the testing device manufacturer's instructions.

1210.2.6 Testing agency. Testing shall be performed by the builder, a registered design professional or an approved third party.

1210.2.7 Time period. Testing shall extend at least 48 hours or to the minimum specified by the testing device manufacturer, which ever is longer. This initial testing shall be permitted to extend past occupancy.

1210.2.8 Test results. Test results shall be provided directly to the owner by the test lab or testing party. The test results shall be delivered before or after occupancy.

2010.2.9 Additional test kit. An additional pre-paid test kit shall be provided to the owner to use when they choose. The test kit shall include mailing, or emailing the results from the testing lab to the owner. The builder shall also be permitted to receive the test results.

1210.2.10 Test result. This section does not require a specific test result, rather it requires the test be performed and the results be provided to the registered design professional or owner.

1210.2.11 Test result report. The registered design professional or owner shall be informed prior to occupancy and in writing that "A radon test result of 4 pCi/L or above is the 'action level' set by the U.S. Environmental Protection Agency (EPA. EPA recommends radon reduction measures to lower radon levels below 4 pCi/L." Or "For a radon test result of 4 pCi/L or above [name of builder or jurisdiction having authority] recommends radon reduction measures to lower radon levels below 4 pCi/L."

1210.3 Radon reduction measures. Radon reduction measures shall be in accordance with Sections 1210.3.1 through 1210.3.6 and Table 1210.3.

1210.3.1 Soil-gas barriers and base course. A base course in accordance with Section 1805.4.1 shall be installed below slabs and foundations. There shall be a continuous base course under each soil-gas retarder that is separated by foundation walls or footings. Foundation walls and floors in contact with the soil shall be damp proofed or waterproofed in accordance with Section 1805. Punctures, tears and gaps around penetrations of the soil-gas retarder shall be repaired or covered with an additional soil-gas retarder. The soil-gas retarder shall be a continuous 6-mil (0.15 mm) polyethylene or an approved equivalent. Approved alternative soil gas collection areas, such as sealed crawlspaces, shall be permitted.

1210.3.2 Soil gas collection. There shall be an unobstructed path for soil gas flow within the base course and out through the vent in the roof. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than 4 inches (10 cm) and not less than 10 ft (3 m) in total length that is mechanically fastened to a tee with two horizontal openings within the base course for radon collection or an equivalent method. The tee fitting connection within the base course and the soil gas vent pipe that extends to the roof shall be designed to prevent clogging of the radon collection path. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method.

1210.3.3 Soil gas entry routes. Openings in slabs, soil-gas retarders, and joints such as plumbing, ground water control systems, soil-gas vent pipes, piping and structural supports, shall be sealed against air leakage at the penetrations with a polyurethane caulk, expanding foam or other approved sealing method. Gaps, seams and joints below grade in walls and footings that surround soil gas collection areas shall be closed with cementitious materials, damp proofing, or other approved products. Closure shall be provided to prevent air migration between the base course that serves soil gas collection and exterior foundation drain systems located outside of the walls or footings that surround the soil gas collection areas. Masonry unit walls below grade shall provide a barrier between soil gas and interior spaces, including but not limited to, barriers within the hollow masonry units, full grouting, solid masonry units or other approved method. Sumps intended for ground water control shall have gasketed lids or be otherwise sealed and shall not be connected to the soil-gas exhaust system.

1210.3.4 Soil gas vent. A gas-tight vent pipe not less than 3 to 4 inches in diameter shall extend from the soil-gas permeable layer through the roof. Alternately, the vent shall extend from the soil-gas permeable layer to at least 30 feet above grade and shall not be less than 4 feet vertically above or 10 feet horizontally away from operable windows, doors or skylights. The vent pipe shall be sloped to avoid collecting condensate or rainwater. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof. Exposed and visible interior vent pipes shall be identified with not less than one label reading "Radon Reduction System" on each floor and in habitable attics.

1210.3.5 Vent pipe diameter. The minimum vent pipe diameter shall be as specified in Table 1210.3.5.

TABLE 1210.3.5
Maximum Vented Foundation Area

Maximum Area Vented	Minimum Pipe Diameter
<u>2,500 ft² (232 m²)</u>	<u>3 inch (7.6 cm)</u>
<u>4,000 ft² (372 m²)</u>	<u>4 inch (10 cm)</u>
<u>Unlimited</u>	<u>6 inch (15.2 cm)</u>

1210.3.6 Multiple vented areas. In dwellings where interior footings or other barriers separate the soil- gas permeable layer, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or individual vent pipes shall terminate separately above the roof.

1210.3.7 Fan. Each sub-slab soil-gas exhaust system shall include a fan, or dedicated space for the post-construction installation of a fan. The electrical supply for the fan shall be located within 6 feet (1.8 m) of the fan.

Reason:

Radon in schools presents a significant health risk. Thousands of schools are affected by radon. EPA found that 41% of schools that had high radon were located geographically within Zone 1 (high radon potential), It is common knowledge that there is no way to know your building's radon level unless you test. Post-construction mitigation is very expensive; preventative measures, such as adding radon reducing features during construction, can save future costs and lives.

Cost Impact

The code change proposal will increase the cost of construction .

The cost of three test kits with prepaid analysis and prepaid postage is less than \$80, probably less than \$50 in builder quantity including tax. Where there were multiple spaces that are physically separated and served by different HVAC systems each space would incur that cost.

The cost of the measures in the building varies widely with building size. Many elements of the radon resistant features are already required by code; for example, the base coarse under the foundation, and air tightness for the building; these would not add cost for the radon system.

Internal ID: 1794

G136-18

IBC: 202, 503.1.4, 1510.2.2

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BG] PENTHOUSE. An enclosed, unoccupied rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, stairways and vertical shaft openings.

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the *building area* as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504 provided the penthouses and other enclosed roof structures comply with Section 1510.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Section 907.5 is provided in the area of the occupied roof.
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.

SECTION 1510 ROOFTOP STRUCTURES

[BG] 1510.1 General. The provisions of this section shall govern the construction of rooftop structures.

1510.1.1 Area limitation. The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining the building area or number of stories as regulated by Section 503.1. The area of such penthouses shall not be included in determining the fire area specified in Section 901.7.

[BG] 1510.2 Penthouses. Penthouses in compliance with Sections 1510.2.1 through 1510.2.5 shall be considered as a portion of the story directly below the roof deck on which such penthouses are located. Other penthouses shall be considered as an additional story of the building.

[BG] 1510.2.1 Height above roof deck. Penthouses constructed on buildings of other than Type I construction shall not exceed 18 feet (5486 mm) in height above the roof deck as measured to the average height of the roof of the penthouse. Penthouses located on the roof of buildings of Type I construction shall not be limited in height.

Exception: Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.

[BG] 1510.2.2 Use limitations. Penthouses shall not be used for purposes other than the shelter of mechanical or electrical equipment, tanks, elevators and related machinery, stairways or vertical shaft openings in the roof ~~assembly~~ assembly, including ancillary spaces used to access elevators and stairways.

Reason:

This is part of a series of 3 proposals dealing with occupied roofs. See BCAC proposals to Section 1006 and 1009.

Although it was felt the original intent of the egress associated with occupied roofs was clear, we felt there were a few remaining provisions that left doubt as to what was intended. It had been reported that some code officials had interpreted the existing code provision to treat an unoccupied roof as an additional story so as to decrease the actual allowable stories in Chapter 5. To clarify that occupied roofs are not considered stories and are permitted to be used provide that egress is provided in accordance with all applicable sections of the IBC and IFC purposes in a manner “as if they were a story” without applying other “story” requirements like those associated with height and area limitations in Chapter 5 or fire area provisions of Chapter 9, we propose the above modifications as summarized below:

In Section 202, the definition of “PENTHOUSE” is proposed to be modified by adding the word “stairway”. This reinforces the existing and proposed language in Section 1510 that excludes certain allowable rooftop structures from being considered additional stories. The definition was not modified to include vestibule type areas as this is addressed in the proposed change to Section 1510.2.2.

The proposal in Section 503.1.4 Occupied roofs, adds a clarifying statement to support the concept that occupied roofs and other enclosed structures in Section 1510 are not an additional story.

Proposed modifications to Section 1510 Rooftop Structures include the additions of the word “Stairways” and the term, including ancillary spaces used to access elevators and stairways.” to Section 1510.2.2. Use Limitations.

As flat/ low-slope rooftops are increasingly, and intentionally, being designed and utilized for occupancies similar to those on occupied floor levels below, modifications to the current code are necessary to define rooftop structures that are occupied and ancillary to approved occupied roof uses and to clarify that these structures must comply with means of egress requirements, but are not a story for height and area limitations. In addition, the proposed modifications described above align the limitations for Occupied roof ancillary structures with those for penthouses as a reasonable approach based upon the shared characteristics of the two structure types.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/codedevelopment-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is a clarification reminder of the scope of requirements included in the identified sections.

Internal ID: 516

G137-18

IBC: 2703 (New), 2703.1 (New), 2703.2 (New), 2703.3 (New), 2703.4 (New), Chapter 35

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Building Code

Add new text as follows:

SECTION 2703 LIGHTNING PROTECTION SYSTEMS

2703.1 General. Where provided, lightning protection systems shall comply with Sections 2703.2 through 2703.4

2703.2 Installation. Lightning protection systems for all new buildings and additions shall be installed in accordance with one of the following methods:

1. NFPA 780.
2. UL 96A.
3. Other approved methods.

UL 96A shall not be utilized for structures used for the production, handling, or storage of ammunition, explosives, flammable liquids or gases, and other explosive ingredients including dust.

2703.3 Additions to existing systems. Where additions are constructed to a building containing a lightning protection system and the existing building's lightning protection system is connected to the new lightning protection system, the entire system shall be inspected and brought into compliance with current standards.

2703.4 Surge protection. Surge protection devices shall be installed for all normal and emergency electrical systems and all communications systems in accordance with Section 2703.2 and NFPA 70.

Add new standard(s) follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

96A-2016:

Standard for Installation Requirements for Lightning Protection Systems

NFPA

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

780-17:

Standard for the Installation of Lightning Protection Systems

Reason:

Requirements pertaining to Lightning Protection Systems are not currently found within the building code. This code change does not require the installation of lightning protection systems, but simply provides guidance to those that are installing and inspecting lightning protection. NFPA 780 and UL 96A are two standards that are widely used within the industry, but are not very well known to code officials. These standards are in harmony with the provisions of the National Electrical Code, NFPA 70. UL 96A can be used for the installation and inspection of many lightning protection systems but the standard has limitations that are identified in this proposal. This proposal also recognizes the existence of other approved methods currently used, and thus this proposal is not intended to limit these installations. This proposal is intended to provide the code official with help in addressing the installation of these types of systems.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The cost will not increase since these requirements are being used today to install and inspect lightning protection systems.

Analysis: A review of the standards proposed for inclusion in the code, NFPA 780-17 and UL 96A-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 234

G138-18

IBC: 3001.2

Proponent: Andrew Cid, Barrier Free Solutions For The Deaf and Hard of Hearing, representing Barrier Free Solutions For The Deaf and Hard of Hearing

2018 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech

impaired. An emergency two-way communication system shall be ~~provided~~provided. The system shall provide visible text and audible modes that:

1. ~~Is a visual and text based and a video based 24/7 live interactive system.~~When operating in each mode, includes a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel;
2. ~~Is fully accessible by the deaf, hard of hearing and speech impaired, and shall include voice only options for hearing individuals. Has the ability to communicate with emergency personnel utilizing existing video conferencing technology, chat/text software or other approved technology.~~operational when the elevator is operational; and
3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

Reason:

This proposal is submitted as there is no new standard published, as of this writing, under the ASME a17 in support of IBC 2018 3001.2. This code proposal also provides additional direction and clarification for industry. Underlined wording is added text to capture the intent of the proposal. This proposal clarifies as to what type of feature and assistance is required and shall be provided regards to the utilization of a text-based system (consisting of keyboard, visual indicators and button indicators) by an entrapped Deaf or Hard of Hearing passenger(s).

I have been working with a dedicated group of industry professionals who have been working hard to develop an a17 standard for 3001.2. My participation in these ASME efforts for the past 3 years have been exciting and productive in attempting to improve the standard to include criteria for these systems. However, the ASME a17 EOC reviews are not yet completed and finalized to my satisfaction to the current code.

It is unfortunate that due to code hearing revision schedules between the ICC and the A17 Emergency Operations Committee where the ICC has a 1/8/18 proposal closing date and the A17 committee may have some possible revisions to 2.27 of A17.1 later this year reflecting provisions addressing two-way communication incorporating video means. It is hopeful that work continues on proposed revisions to 2.27 satisfying the intent of the original provisions of 3001.2. It is recognized that as a general practice that the applicable standard as referenced by the IBC contain the necessary text and provisions and it is the intent that once the A17 committee has developed the necessary language that incorporates the provisions of 3001.2 that this section could be removed. But until such time, recognizing that the A17.1 document revision schedule may not permit inclusion for the 2021 IBC edition, the provisions of 3001.2 need to be maintained.

Unfortunately, I have been the target of recent threats, bullying and intimidation by some individuals who are attempting to discredit me or disrupt our standard language efforts. As a result, I fear for my safety and well being. However, I will continue working to provide assistance to industry, to Fire/Life Safety and First Responders in their jobs in helping others, and to provide access to 50M Deaf & Hard of Hearing citizens.

I hope the IBC committee, industry representatives, and the ICC voters, especially the professional First Responders, agree with this proposal. If approved, this will be effective 2021 and the a17 will hopefully be in place by then to support 3001.2.

Cost Impact

The code change proposal will increase the cost of construction .

The code change proposal may increase the cost of construction by a minimum of less than \$250 (the approximate cost of a keyboard component and several visual indicators)..

Internal ID: 808

G139-18

IBC: 3001.2, DOJ (New)

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2018 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. ~~An emergency two-way communication system shall be provided that:~~

- ~~1. Is a visual and text based and a video based 24/7 live interactive system.~~
- ~~2. Is fully The elevator emergency communication shall provide effective communication as required by Section 36.303 of ADA Title III. The emergency communication shall be installed in accordance with the provisions of ASME A17.1/CSA B44 and NFPA 72 and shall be accessible by the deaf, hard of hearing and speech impaired, and shall include voice-only options for hearing individuals.~~
- ~~3. Has the ability to communicate with emergency personnel utilizing existing video conferencing technology, chat/text software or other approved technology available twenty-four hours a day, seven days a week, as a live interactive system.~~

Add new standard(s) follows:

DOJ United States Department of Justice Civil Rights Division

ADA Title III Regulations - Americans with Disabilities Act, Public Accommodations and Commercial Facilities

Reason:

Section 3001 defines the scope and reference standards for elevator Emergency Communication design requirements. This proposal removes an elevator design requirements from the building code, restoring it to the reference standards. The added reference to the ADA Title III is the regulation specifically for effective communication with the deaf, hard of hearing and speech impaired.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal will neither increase or decrease the cost of construction because it is simply restoring the technical requirements to the reference standards as opposed to including them in the IBC.

Analysis:

A review of DOJ ADA Title III Regulations, as proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

ASME A17.1/CSA B44 and NFPA 72, as referenced in this proposal, are currently referenced in the code.

Internal ID: 1274

G140-18

IBC: 3002.3, 3002.3.1 (New)

Proponent: Ed Kullik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Revise as follows:

3002.3 Emergency signs for other than occupant evacuation elevators... Where other than occupant evacuation elevators are provided, an *approved* pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the ~~exit stairways~~ exits and not to use the elevators in case of fire. The sign shall read: IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE. USE EXIT STAIRS.

~~Exceptions~~ **Exception:**

- ~~1.~~ The emergency sign shall not be required for elevators that are part of an accessible *means of egress* complying with Section 1009.4.
- ~~2.~~ The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008.

Add new text as follows:

3002.3.1 Emergency signs for occupant evacuation elevators. Where occupant evacuation elevators are provided, an approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use occupant evacuation elevators in the event of fire. The sign shall read: IN CASE OF FIRE, THIS OCCUPANT EVACUATION ELEVATOR IS AVAILABLE FOR EXITING THE BUILDING.

Analysis: Duplicated text in the International Fire Code not shown for brevity.

Reason:

This is one of 17 proposals being submitted as a package relating to technical and organizational changes proposed for Chapter 6 of the Fire Code. While the Code Committees will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

This proposal correlates with the series of proposals to the IFC Chapter 6 submitted by the F-CAC for correlation of Elevator requirements and specification of required signage for all elevators.

This proposal addresses the emergency signage for the elevators in the IBC and the IFC. The changes are reflected in the IBC as these are the parent sections for these requirements. If approved this language will be duplicated in Chapter 6 of the IFC. This also correlates with the signage requirements in ASME A17.1. Exit stairways were changed to "exits" because there could be ramps instead of stairways.

Two distinct sections are established between occupant evacuation elevators and other than those elevators.

This proposal also adds standardized language to both the IBC and the IFC for occupant evacuation elevator signage to ensure consistency between codes and to provide clear and concise building occupant instruction for their use.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) in support of the FCAC's efforts. 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 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Cost Impact

The code change proposal will decrease the cost of construction.

By providing standardized language for the emergency signs for occupant evacuation elevators, and correlating for consistency the standardized language for other elevators.

Internal ID: 407

G141-18

IBC: 3003.1 (New)

Proponent: Keith Flanders, Cosentini Associates, representing self (kflanders@cosentini.com)

2018 International Building Code

Add new text as follows:

3003.1 Elevator Power. Upon loss of power, elevators shall be relocated to the lobby or the nearest floor level and the hoistway doors shall be opened.

Reason:

The applicable codes for elevators and vertical lifts do not currently require a means to lower to the nearest floor or lobby upon loss of power. Where the elevators are not provided with standby power, this leads to occupants becoming entrapped and require assistance from a responding fire department. There is often confusion as to whether this is required, and many may think it is common sense. However, there is nothing in the codes that explicitly requires such an action upon loss of power. Accordingly, this code change proposal includes the specific language to avoid any further confusion and to limit the possibility of occupants becoming entrapped.

Cost Impact

The code change proposal will increase the cost of construction .

This may have a slight impact on the cost of construction; however, it is often included regardless and therefore may not have an impact.

Internal ID: 1019

G142-18

IBC: 3007.1

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2018 International Building Code

3007.1 General. Where required by Section 403.6.1, every floor above and including the lowest level of fire department vehicle access of the building shall be served by fire service access elevators complying with Sections 3007.1 through 3007.9. Except as modified in this section, fire service access elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

~~Exception~~ Exceptions:

1. Elevators that only service an open or enclosed parking garage and the lobby of the building shall not be required to serve as fire service access elevators.
2. The elevator shall not be required to serve the top floor of a building where that floor is utilized only for equipment for building systems.

Reason:

To align with Section 403.6.1 which addresses occupied floors.

Cost Impact

The code change proposal will decrease the cost of construction .

This would decrease the cost of construction because it would not require an extension on top of the roof of the building so that the elevator could serve an unoccupied floor.

Internal ID: 1449

G143-18

IBC: 3005.4

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2018 International Building Code

3005.4 Machine rooms, control rooms, machinery spaces, and control spaces. ~~Elevator machine rooms, control rooms, control spaces and machinery spaces outside of but attached to a hoistway that have openings into the hoistway.~~ The following rooms and spaces shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or ~~both~~ both:

1. Machine rooms
2. Control rooms
3. Control spaces
4. Machinery spaces outside of the hoistway enclosure

The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.

Exceptions:

1. For other than fire service access elevators and occupant evacuation elevators, where machine rooms, machinery spaces, control rooms and control spaces do not abut and do not have openings to the hoistway enclosure they serve, the *fire barriers* constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fire-resistance rating*.
2. For other than fire service access elevators and occupant evacuation elevators, in buildings four *stories* or less above *grade plane* where machine room, machinery spaces, control rooms and control spaces do not abut and do not have openings to the hoistway enclosure they serve, the machine room, machinery spaces, control rooms and control spaces are not required to be fire-resistance rated.

Reason:

There was some confusion with the current wording that the phrase " outside of but attached to a hoistway that have openings into the hoistway" as to how it relates to machine rooms. Essentially this could be possibly interpreted that if no openings to the hoistway exist that a fire resistance rated enclosure would not be required. Control rooms and control spaces should be treated no differently for separation requirements so the added phrase is not necessary. This section is essentially an extension of the hoistway protection.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no impact since this is just a clarification of the language.

Internal ID: 1451

G144-18

IBC: 3007.3

Proponent: John Mengedoht, representing NBBJ (jmengedoht@nbbj.com)

2018 International Building Code

Revise as follows:

3007.3 Water protection. Water from the operation of an automatic sprinkler system outside the enclosed lobby shall be prevented from infiltrating into the hoistway enclosure by means of a curb and elevator entrance floor levels not less than 1 inch (25.4 mm) above floor areas outside of the lobby area or in accordance with ~~an~~ other approved method-methods.

Reason:

2018 IBC Section 3007.3 does not establish any criteria for an approved method of preventing water from entering the hoistway for fire service access elevators. Establishing a 1 inch height as a minimum for a curb at the hoistway and for the floor at the elevator entrances provides criteria for one approach without the need for floor drains or trench drains, which are an infection risk in high rise hospitals and generally not preferred in high rise office buildings. The 1 inch height is more than necessary to prevent water intrusion into a hoistway but allows for buildings where floors may not be particularly level and might slope downward toward the building core.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Establishing one reasonable method of compliance does not rule out other approved solutions and does not increase cost unless a lower height than 1 inch has been widely accepted by code officials previously.

Internal ID: 2290

G145-18

IBC: 3007.8.1, 3008.8.2

Proponent: Lee Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows:

3007.8.1 Protection of ~~wiring or cables~~ equipment, control wiring, power wiring and ductwork.

Equipment control wiring, power wiring and ductwork shall be independent of other building ventilation or pressurization systems and shall be protected in accordance with Section 909.20.6.1.

~~Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected using one of the following methods:~~

- ~~1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 2 hours.~~
- ~~2. Electrical circuit protective systems shall have a fire-resistance rating of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.~~
- ~~3. Construction having a fire-resistance rating of not less than 2 hours.~~

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operations.

3008.8.2 Protection of ~~wiring or cables~~ equipment, control wiring, power wiring and ductwork.

Equipment, control wiring, power wiring and ductwork shall be independent of other building ventilation or pressurization systems and shall be protected in accordance with Section 909.20.6.1.

~~Wires or cables that are located outside of the elevator hoistway, machine room, control room and control space and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to occupant evacuation elevators shall be protected using one of the following methods:~~

- ~~1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 2 hours.~~
- ~~2. Electrical circuit protective systems shall have a fire-resistance rating of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.~~
- ~~3. Construction having a fire-resistance rating of not less than 2 hours.~~

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

Reason:

The scope of this proposal adds "equipment" and "ductwork" to the list of items needing fire-resistance rated protection for Fire Service Access Elevators and Occupant Evacuation Elevators. It replaces the current text with a reference to Section 909.20.6.1. These established protection measures for pressurized stair enclosures will create a consistent approach for pressurized hoistways. This proposal references Section 909.20.6.1 which includes not only the wiring but also the equipment and ductwork associated the pressurization of the shaft and are critical components of this life-safety system. The exception related to protection of wiring and cables for control signals is maintained in both subsections.

Cost Impact

The code change proposal will increase the cost of construction .

There will be additional cost associated with protection of the pressurization fan and ductwork which are not currently required in the code.

G146-18

IBC: 3102.3, 3102.6.1.1

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

Revise as follows:

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IV-HT construction. Other membrane structures shall be classified as Type V construction.

Exception: Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Type IIB, III, IV-HT and V construction, provided that the membrane is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

This code change will result in consistency with the purpose and scope which was to leave intact the current Type IV heavy timber provisions. The HT category was created to differentiate the three (3) new categories of “mass timber”, where HT represents the long established heavy timber category that has been in the ICC family of codes, and the predecessor legacy codes, for decades.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
3308.4 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit <http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, please visit <http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 949

G147-18

IBC: SECTION 202, 202 (New), 3103.1

Proponent: Richard Nix, representing Entertainment Services & Technology Association/Event Safety Alliance
(rnix@zoomtown.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

SPECIAL EVENT STRUCTURE. Any ground-supported structure, platform, stage, stage scaffolding or rigging, canopy, tower or similar structure supporting entertainment-related equipment or signage.

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days. ~~Tents~~Special event structures, tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall also comply with the International Fire Code. ~~Those erected for a longer period of time shall comply with applicable sections of this code.~~

Reason:

These structures are covered under the scope of IBC Chapter 31, Special Construction. IBC Section 3103 addresses installations <180 days, which are considered "temporary". Temporary tents, any type of membrane covered structure and special events structures are therefore within the scope of IBC Chapter 31, section 3102 and/or section 3103. All of these structures except special event structures are referred to IFC Chapter 31. The IFC has added new requirements in Chapter 31 for special events structures, therefore special event structures must also be referred from IBC Chapter 31 to IFC Chapter 31.

Building Code Officials and others using the IBC as a primary code reference require the proper guidance and direction to IFC Chapter 31. In the last code change cycle, F308-16 replaced the IFC term temporary stage canopy with the term temporary special events structure. Therefore, Temporary special events structures are now covered under the purview of IFC Chapter 31. Coordination with IBC Chapter 31 was both implied and intended to occur as a result of F308-16, due to the special construction and temporary characteristics of these structures. However, that coordination did not occur. This CCP ensures proper coordination between IFC and IBC as intended in the last code change cycle.

This proposed definition for Special Events Structures in IBC is slightly different than that used in IFC, because the word "temporary" is implied by the corresponding IBC section 3103, where these structures are currently mentioned.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed change adds a definition for clarity along with a pointer for code coordination.

Internal ID: 311

G148-18

IBC: 3111.1.1, 3111.2, 3111.3.2, 3111.3.3

Proponent: Joseph Cain, Solar Energy Industries Association (SEIA), representing Solar Energy Industries Association (JoeCainPE@gmail.com)

2018 International Building Code

Revise as follows:

3111.1.1 Wind resistance. Rooftop-mounted photovoltaic ~~panels and modules~~ (PV) panel systems and solar thermal collectors shall be designed in accordance with Section 1609.

3111.2 Solar thermal systems. Solar thermal systems shall be designed and installed in accordance with ~~Section 2606.12~~ this section, the International Plumbing Code, the International Mechanical Code and the International Fire Code. Where light-transmitting plastic covers are used, solar thermal collectors shall be designed in accordance with Section 2606.12.

3111.3.2 Fire classification. Rooftop-mounted photovoltaic (PV) panel systems shall have a fire classification in accordance with Section 1505.9. ~~Building-integrated photovoltaic systems~~ BIPV systems installed as the roof covering shall have a fire classification in accordance with Section 1505.8.

3111.3.3 Building-integrated photovoltaic (BIPV) systems. ~~Building-integrated photovoltaic systems that serve as roof coverings~~ BIPV systems installed as the roof covering shall be designed and installed in accordance with Section ~~1507.18-1507.~~

Reason:

Section 3111.1.1 Wind resistance is modified to use the defined term "photovoltaic (PV) panel systems" including the abbreviation PV, and to clarify it is the system designed in accordance with Section 1609, not just PV panels and modules.

Section 3111.2 Solar thermal systems is modified to consider that not all solar thermal collectors incorporate light transmitting plastics.

Section 3111.3.2 Fire classification is modified to use the defined term "photovoltaic (PV) panel systems, including the abbreviation "PV." It is also modified to clarify that the reference to section 1505.8 applies only to BIPV systems installed as the roof covering.

Section 3111.3.3 Building-integrated photovoltaic (BIPV) systems is modified to include the BIPV abbreviation/acronym. It is also modified to include the language "installed as the roof covering," consistent with Section 1505.8 language. The reference to Chapter 15 is corrected to Section 1507, as requirements for BIPV roof covering products are found throughout Section 1507, not just in 1507.18, which is specific to photovoltaic (BIPV) shingles.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Editorial changes only. No changes to technical requirements.

Internal ID: 2003

G149-18

IBC: 3112 (New), 3112.1 (New), 3112.2 (New)

Proponent: Steve Martin, Florida Division of Emergency Management, representing Florida Division of Emergency Management (steve.martin@em.myflorida.com); Douglas Wise, Building Officials Association of Florida, representing Building Officials Association of Florida (douglaswise@att.net)

2018 International Building Code

Add new text as follows:

3112 PUBLIC USE RESTROOM BUILDINGS IN FLOOD HAZARD AREAS

3112.1 General. Public use restroom buildings that contain toilet rooms, bathrooms, showers and changing rooms, and those portions of buildings that contain toilet rooms, bathrooms, showers and changing rooms, and where such buildings and portions of buildings are intended for public use and located on publicly owned lands in flood hazard areas, shall comply with the requirements of this section. Public use restrooms that are not elevated or dry floodproofed in accordance with Section 1612 shall comply with Section 3112.2. Portions of buildings that include uses other than public use toilet rooms, bathrooms, showers and changing rooms shall comply with Section 1612.

3112.2 Flood resistance. Public use restrooms that are located in flood hazard areas shall comply with the requirements of ASCE 24, except for elevation requirements, and shall comply with all of the following criteria:

1. The building footprint is not more than 1,500 square feet.
2. Located, designed and constructed to resist the effects of flood hazards and flood loads to minimize flood damage from a combination of wind and water loads associated with the base flood.
3. Anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy during conditions of the base flood.
4. Constructed of flood damage-resistant materials.
5. Where enclosed by walls, the walls have flood openings.
6. Mechanical and electrical systems are located above the base flood elevation.
7. Plumbing fixtures and plumbing connections are located above the base flood elevation.
8. An emergency plan, approved by the jurisdiction, is submitted to the building official where the building design specifies implementation of protection measures prior to the onset of flooding conditions.

Exceptions:

1. Minimum electric service required to address life safety and electric code requirements is permitted below the base flood elevation.
2. Plumbing fixtures and connections are permitted below the base flood elevation provided the fixtures and connections are designed and installed to minimize or eliminate infiltration of floodwaters into the sanitary sewage system and discharges from sanitary sewage systems into floodwaters.

Reason:

Thousands of communities and state agencies have public open space and parks along rivers and shorelines. Many communities experience economic value from tourism and public access to areas that feature water resources. Under the current requirements of the IBC, restrooms for public use that are located in flood hazard areas must meet the same requirements as residential and commercial buildings. In flood hazard areas other than coastal high hazard areas and Coastal A Zones (i.e., in flood zones identified on Federal Emergency Management Agency Flood Insurance Rate Maps with the letter "A"), restroom buildings must either be elevated or dry floodproofed to or above the elevations required by the IBC/ASCE 24. In coastal high hazard areas (flood Zone V) and Coastal A Zones, restroom buildings must be elevated to or above the elevations required by the IBC/ASCE 24.

In Florida and other coastal states, this has resulted in construction of public use restrooms as high as 6 to 18 feet above grade. This poses many challenges, not the least of which is access. Figures 1, 2, 3 and 4 (below) illustrate

elevated restrooms with long ramps. While ramps can be built to meet ADA requirements, to reach some heights required in some flood hazard areas the ramps may be as long as 300 feet. In coastal high hazard areas, such ramps likely conflict with the NFIP requirements that elevated buildings be “free of obstruction,” and the presence of such ramps would likely interfere with the ability of walls around enclosures to break away under flood conditions. Those same provisions are required by IBC Section 1612, Flood Loads, which references ASCE 24, Flood Resistant Design and Construction.

Long ramps defeat accessibility when the distance of travel still renders restroom facilities inaccessible to many persons with disabilities or limited mobility. Although the IBC (and FEMA) permits elevators to extend below the base flood elevation, installing elevators to provide access to elevated public use restrooms is expensive and creates many maintenance issues, and a high rate of failure to function, especially in beach areas where blowing sand and windborne salt aerosols create corrosive conditions.

This proposal creates a new section in IBC Chapter 31, Special Construction to limit the scope to public use restrooms that include public use toilet rooms, bathrooms, showers and changing rooms and spaces. Portions of such buildings that include other uses would have to fully comply with the elevation and other flood resistant requirements of IBC Section 1612, Flood Loads, which references ASCE 24, Flood Resistant Design and Construction.

In recognition that most public use restrooms are built on public land using public funds, the proposal is to limit the potential financial losses associated with flooded public facilities in two ways: by limiting the footprint to not more than 1,500 square feet and by specifying design requirements that minimize or eliminate physical damage when flooding occurs. Enabling public use restrooms to be designed to withstand the hydrodynamic and hydrostatic loads below the base flood elevation is an appropriate alternative to the extremely high cost for design, construction and maintenance of highly elevated public restrooms and their required access ramps or elevators.

Although the proposed design requirements are intended to preclude significant damage during flood conditions up to and including conditions of the design flood (e.g., the base or 100-year flood), more severe floods can and do occur. Figure 5 (below) illustrates one modest design option that demonstrates the feasibility of the proposal. It shows a small masonry restroom on a beach after Hurricane Irma pushed onshore. The drawings for the building show below-grade piling support and it appears the masonry units were filled. Despite approximately 6-8 feet of flooding (including waves), there is no evidence of structural damage and the non-structural damage appears readily repairable.

The proposal includes requirements for flood resistance similar to those found in IBC Appendix G, Section G1001 for Utility and Miscellaneous Group U and similar to the requirements of ASCE 24-14 for Flood Design Class 1 (which is essentially equivalent to Structure/Risk Category I). Those requirements effectively are the same as the NFIP requirements in 44 Code of Federal Regulations Section 60.3(a)(3)(ii), (iii), and (iv). FEMA deems the flood provisions of the I-Codes, with reference to ASCE 24, to meet or exceed the requirements of the National Flood Insurance Program (NFIP).

The intent is to allow public use restrooms to be at-grade or above-grade but below the base flood (partially elevated), provided they meet the design requirements listed in 3112.2. The proponent acknowledges that, at present, FEMA guidance states that restroom buildings and comfort stations in coastal high hazard areas must be elevated and meet the same design and construction requirements as other buildings. This proposal is intended to meet the intent of all NFIP requirements, except elevation requirements, to minimize flood damage, while acknowledging the special needs and access required or appropriate for public use restrooms. The Florida Floodplain Management Association prepared a white paper on this subject: Policy and Design Options for Public Restrooms in Special Flood Hazard Areas (2014), www.FLfloods.org/ffmawhitepaper.



Figure 1. Florida, flood Zone V. Ramp wraps around entire building. Has composting toilets, battery and solar electric system, emergency plan requires pumping out tank and filling with clean water.



Figure 2. Coastal Mississippi, flood Zone V. This facility cost \$1.1 million.



Figure 3. Florida, Gulf Coast, flood Zone V. Ramp built after original elevator determined to be unsustainable due to significant maintenance problems.



Figure 4. Southwest Florida, flood Zone V. Extensive ramp wraps around three sides.



Figure 5. Florida, after Hurricane Irma, flood Zone V. No evidence of structural damage after estimated 5 ft stillwater plus waves. From upper left: facing beach, side, interior, rear.

Bibliography:

Policy and Design Options for Public Restrooms in Special Flood Hazard Areas, Florida Floodplain Management Associations, 2014. 55 pages. www.FLfloods.org/ffmawhitepaper

Cost Impact

The code change proposal will decrease the cost of construction .

The proposal will lower the initial cost of construction and lower routine and long-term facility maintenance. The cost to construct as specified in this proposal to resist the effects of flood hazards and flood loads may be somewhat higher than a typical non-elevated restroom building that is not designed to resist flood loads and flood damage (not currently allowed). However, the cost for construction under the proposal will be less than the cost to elevate and provide and maintain elevators and extensive ramp systems (current method of compliance).

Internal ID: 1094

G150-18

IBC: 3112.4, 3112.5

Proponent: Mike Fischer, Kellen Company, representing The Plastic Glazing Coalition of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

3112.4 Glass and glazing. Glass and glazing used in *greenhouses* shall comply with Section 2405.

Revise as follows:

3112.5 Light-transmitting plastics. Light-transmitting ~~plastics shall be permitted in lieu of plain glass~~ plastic used as glazing in greenhouses ~~and~~ shall comply with Section 2405 and Section 2606.

Reason:

The current section 3112.5 for light transmitting plastics in greenhouses reads almost as an exception to Section 3112.4 for glass in greenhouses when in fact they contain separate provisions. This change clarifies that the glazing provisions in Section 2405 apply to light-transmitting plastics used as glazing, and maintains the reference to Section 2606.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is editorial and changes no technical provisions.

Internal ID: 2012

G151-18

IBC: (New), 3101.1, 3114 (New), 3114.1 (New), 3114.2 (New), 3114.3 (New), 3114.4 (New), 3114.5 (New), 3114.6 (New), 3114.7 (New), 3114.8 (New), 3114.8.1 (New), 3114.8.1.1 (New), 3114.8.2 (New), 3114.8.3 (New), 3114.8.4 (New), 3114.8.4.1 (New), 3114.8.4.2 (New), 3114.8.4.3 (New), 3114.8.5 (New), 3114.8.5.1 (New), 3114.8.5.2 (New), 3114.8.5.3 (New), 3114.8.5.3(1) (New), 3114.8.5.3(2) (New), 3114.8.5.3(4) (New), 3114.8.5.3(3) (New), 3114.8.5.3 (New), Chapter 35

Proponent: Ed Kullik, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Add new definition as follows:

INTERMODAL SHIPPING CONTAINER. A six-sided steel unit originally constructed as a general cargo container used for the transport of goods and materials.

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, *pedestrian walkways* and tunnels, automatic vehicular gates, awnings and *canopies*, marquees, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices, ~~and solar energy systems.~~ ~~systems~~ and intermodal shipping containers.

Add new text as follows:

SECTION 3114 INTERMODAL SHIPPING CONTAINERS

3114.1 General. The provisions of Section 3114 and other applicable sections of this code, shall apply to intermodal shipping containers that are repurposed for use as buildings or structures or as a part of buildings or structures.

Exceptions:

1. Intermodal shipping containers previously approved as existing relocatable buildings complying with Chapter 14 of the International Existing Building Code.
2. Stationary storage battery arrays located in intermodal shipping containers complying with Chapter 12 of the International Fire Code.
3. Intermodal shipping containers that are listed as equipment complying with the standard for equipment, such as air chillers, engine generators, modular data centers, and other similar equipment.

3114.2 Construction Documents. The construction documents shall contain information to verify the dimensions and establish the physical properties of the steel components, and wood floor components, of the intermodal shipping container in addition to the information required by Sections 107 and 1603.

3114.3 Intermodal shipping container information. Intermodal shipping containers shall bear an existing data plate containing the following information as required by ISO 6346 and verified by an approved agency. A report of the verification process and findings shall be provided to the building owner.

1. Manufacturer's name or identification number
2. Date manufactured.
3. Safety approval number.
4. Identification number.
5. Maximum operating gross mass (kg) (Lbs)
6. Allowable stacking load for 1.8G (kg) (lbs)
7. Transverse racking test force (Newtons)
8. Valid maintenance examination date

Where approved by the building official, the markings and existing data plate are permitted to be removed from the intermodal shipping containers before they are repurposed for use as buildings or structures or as a part of buildings or structures.

3114.4 Protection against decay and termites. Wood structural floors of intermodal shipping containers shall be protected from decay and termites in accordance with the applicable provisions of Section 2304.12.1.1.

3114.5 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any intermodal shipping container, except spaces occupied by basements and cellars, shall be provided with ventilation in accordance with Section 1202.4.

3114.6 Roof assemblies. Intermodal shipping container roof assemblies shall comply with the applicable requirements of Chapter 15.

Exception: Single-unit stand-alone intermodal shipping containers not attached to, or stacked vertically over, other intermodal shipping containers, buildings or structures.

3114.7 Joints and voids. Joints and voids that create concealed spaces between intermodal shipping containers, that are connected or stacked, at fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system in accordance with Section 715.

3114.8 Structural. Intermodal shipping containers which conform to ISO 1496-1 that are repurposed for use as buildings or structures, or as a part of buildings or structures, shall be designed in accordance with Chapter 16 and this section.

3114.8.1 Foundations. Intermodal shipping containers repurposed for use as a permanent building or structure shall be supported on foundations or other supporting structures designed and constructed in accordance with Chapters 16 through 23 of this code.

3114.8.1.1 Anchorage. Intermodal shipping containers shall be anchored to foundations or other supporting structures as necessary to provide a continuous load path for all applicable design and environmental loads in accordance with Chapter 16.

3114.8.2 Welds. All new welds and connections shall be equal to or greater than the original connections.

3114.8.3 Structural design. The structural design for the intermodal shipping containers repurposed for use as a building or structure, or as part of a building or structure, shall comply with Section 3114.8.4 or 3114.8.5.

3114.8.4 Detailed design procedure. A structural analysis meeting the requirements of this section shall be provided to the building official to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Intermodal shipping containers designed in accordance with Section 3114.8.5.

3114.8.4.1 Material properties. Structural material properties for existing intermodal shipping container steel components shall be established by material testing where the steel grade and composition cannot be identified by the manufacturer's designation as to manufacture and mill test.

3114.8.4.2 Seismic design parameters. The appropriate detailing requirements of ASCE 7; response modification coefficient, R ; overstrength factor, Ω_0 ; deflection amplification factor, C_d ; and limits on structural height, h_n , for the corrugated shear wall is permitted to be developed in accordance with generally accepted procedures where approved by the building official in accordance with Section 104.11.

3114.8.4.3 Allowable shear value. The allowable shear values for the intermodal shipping container corrugated steel sheet panel side walls and end walls shall be demonstrated by testing and analysis accordance with Section 104.11. Where penetrations are made in the side walls or end walls designated as part of the lateral force-resisting system, the penetrations shall be substantiated by rational analysis.

3114.8.5 Simplified structural design of single-unit containers. Single-unit intermodal shipping containers conforming to the limitations of Section 3114.8.5.1 shall be permitted to be designed in accordance with the simplified structural design provisions of Section 3114.8.5.

3114.8.5.1 Limitations. Use of Section 3114.8.5 is subject to all the following limitations:

1. The intermodal shipping container shall be a single-unit, stand-alone unit supported on a foundation and shall not be in contact with or supporting any other shipping container or other structure.
2. The intermodal shipping container top and bottom rails, corner castings, and columns or any portion thereof shall not be notched, cut, or removed in any manner.

3. The intermodal shipping container shall be erected in a level and horizontal position with the floor located at the bottom.
4. The intermodal shipping container shall be located in Seismic Design Category A, B, C or D.

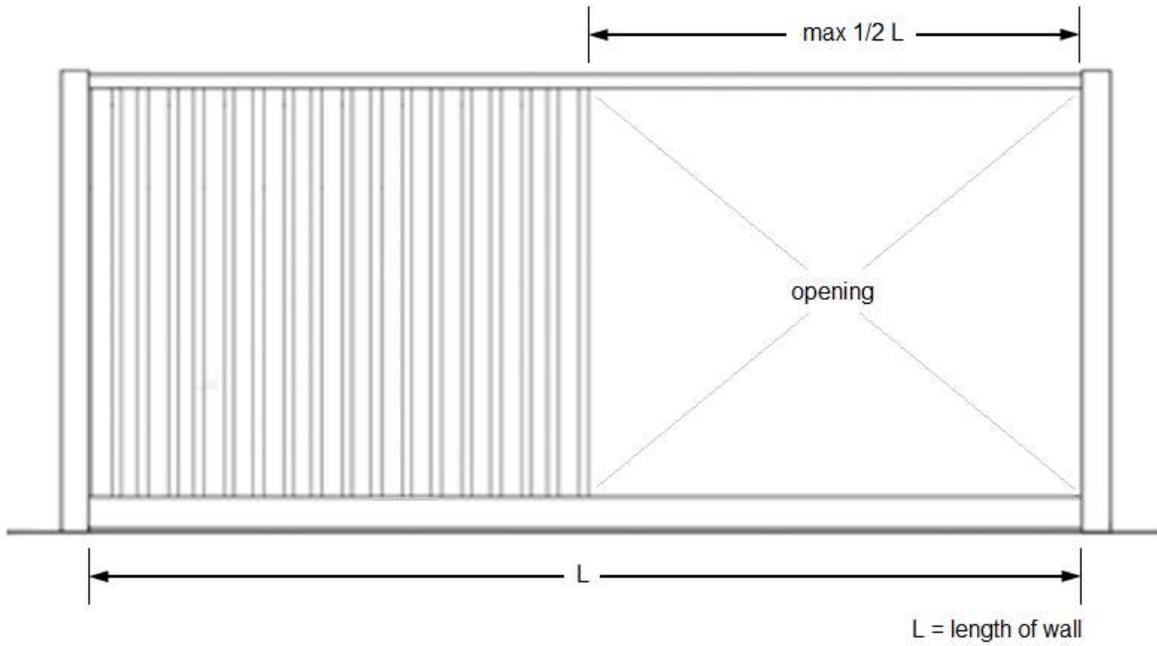
3114.8.5.2 Simplified structural design. Where permitted by Section 3114.8.5.1, single-unit, stand-alone intermodal shipping containers shall be designed using the following assumptions for the corrugated steel shear walls:

1. The appropriate detailing requirements contained in Chapters 16 through 23.
2. Response modification coefficient, $R=2$,
3. Overstrength factor, $\Omega_0=2.5$,
4. Deflection amplification factor, $C_d = 2$, and
5. Limits on structural height, $h_n = 9.5$ feet (2,900 mm).

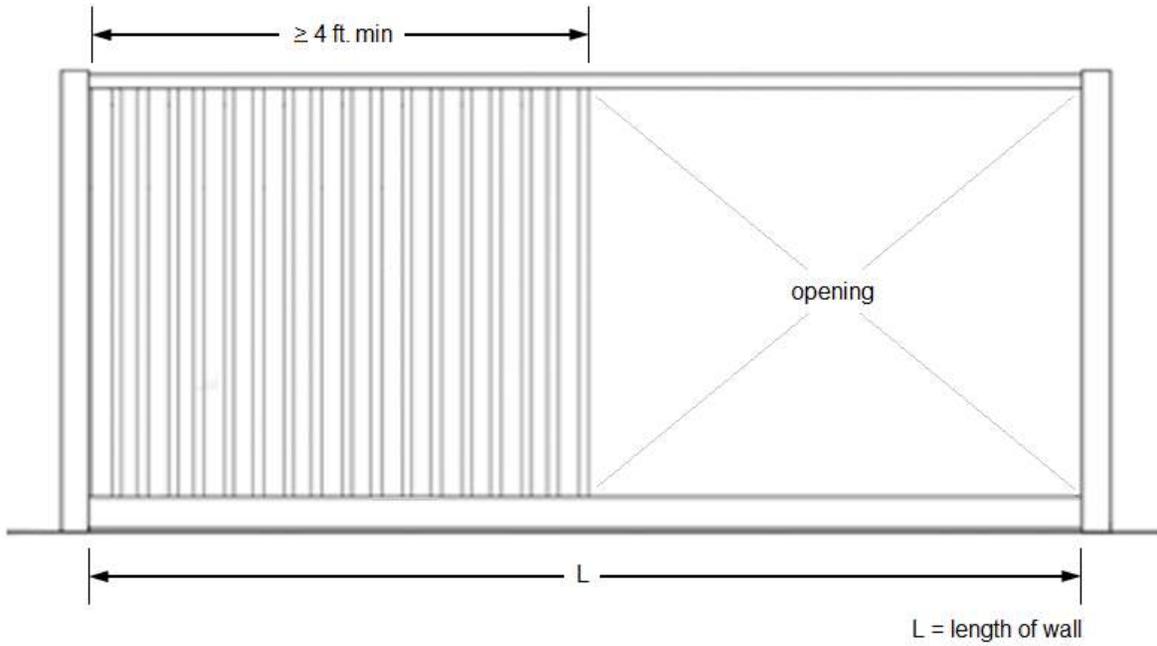
3114.8.5.3 Allowable shear. The allowable shear for the corrugated steel side walls (longitudinal) and end walls (transverse) for wind design and for seismic design using the coefficients of Section 3114.8.5.2 shall be permitted to have the allowable shear values set forth in Table 3114.8.5.3 provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side walls or end walls shall be limited to not more than 50% of the length of that side walls or end walls, as shown in Figure 3114.8.5.3(1).
2. Any full height wall length, or portion thereof, less than 4 feet (305 mm) long shall not be considered as a portion of the lateral force-resisting system, as shown in Figure 3114.8.5.3(2).
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure 3114.8.5.3(3).
4. Where openings are made in container walls, floors, or roofs for doors, windows and other openings:
 - 4.1 The openings shall be framed with steel elements that are designed in accordance with Chapter 16 and Chapter 22.
 - 4.2. The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.
5. A maximum of one penetration not greater than a 6-inch (152 mm) diameter hole for conduits, pipes, tubes or vents, or not greater than 16 square inches (10,322 sq mm) for electrical boxes, is permitted for each individual 8 foot length (2,438 mm) lateral force resisting wall. Penetrations located in walls that are not part of the wall lateral force resisting system shall not be limited in size or quantity. Existing intermodal shipping container vents shall not be considered a penetration, as shown in Figure 3114.8.5.3(4).
6. End wall door or doors designated as part of the lateral force-resisting system shall be welded closed.

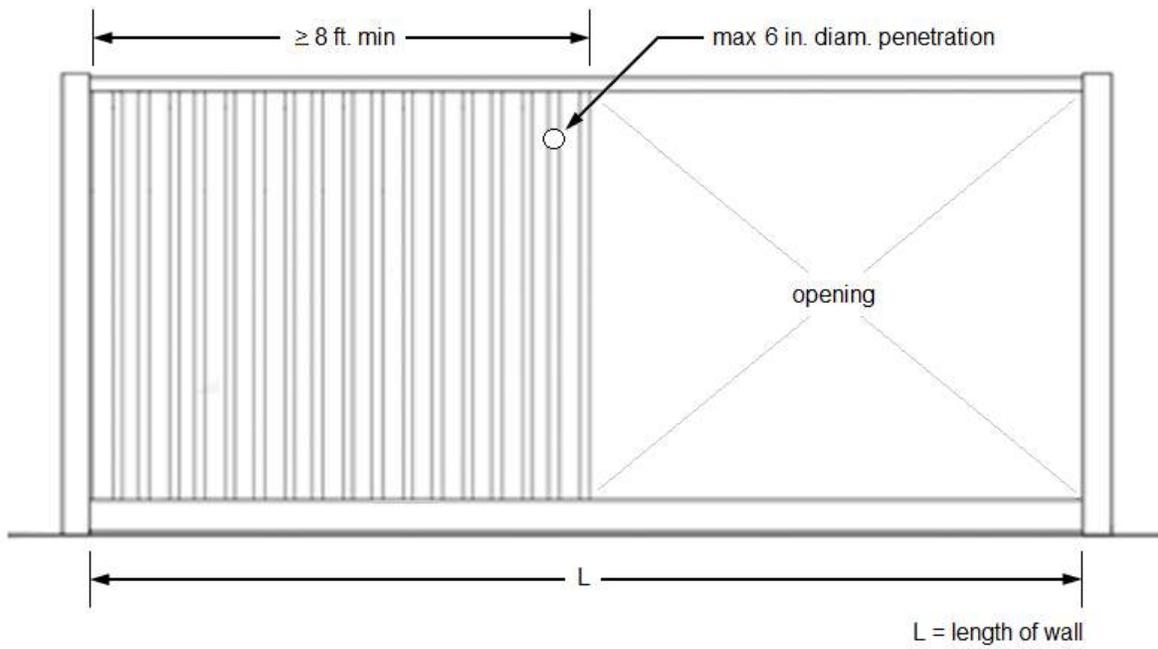
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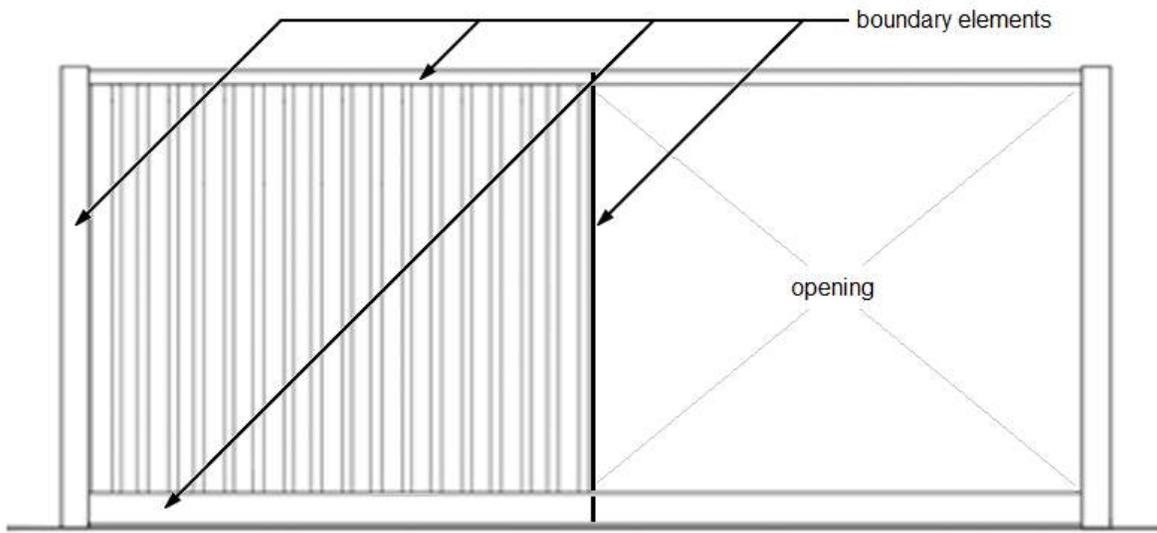
3114.8.5.3(1)
Bracing Unit Distribution--Maximum Linear Length



3114.8.5.3(2)
Bracing Unit Distribution -- Minimum Linear Length



3114.8.5.3(4)
Bracing Unit Distribution -- Penetration Limitations



3114.8.5.3(3)
Bracing Unit Distribution -- Boundary Elements

TABLE 3114.8.5.3**Allowable Strength Values for Intermodal Shipping Container Corrugated Steel Siding Shear Walls for Wind or Seismic Loading**

CONTAINER DESIGNATION ²	CONTAINER DIMENSION (Nominal Length)	CONTAINER DIMENSION (Nominal Height)	ALLOWABLE SHEAR VALUES (PLF) ^{1,3}	
			Side Wall	End Wall
1EEE	45 feet (13.7 M)	9.5 feet (2896 mm)	75	843
1EE		8.6 feet (2591 mm)		
1AAA	40 feet (12.2 M)	9.5 feet (2896 mm)	84	
1AA		8.5 feet (2592 mm)		
1A		8.0 feet (2438 mm)		
1AX				
1BBB	30 feet (9.1 M)	9.5 feet (2896 mm)	112	
1BB		8.5 feet (2591 mm)		
1B		8.0 feet (2438 mm)		
1BX				
1CC	20 feet (9.1 M)	8.5 feet (2591 mm)	168	
1C		8.0 feet (2438 mm)		
1CX				
1D	10 feet (3.0 M)	8.0 feet (2438 mm)	337	
1DX				

1. The allowable strength shear for the side walls and end walls of the intermodal shipping containers are derived from ISO 1496-1 and reduced by a factor of safety of 5.
2. Container designation type is derived from ISO 668.
3. Limitations of Sections 3114.8.5.1 shall apply

Add new standard(s) follows:

ISO

International Organization for
Standardization
Chemin de Blandonnet 8 CP 401
1214 Vernier
Geneva Switzerland

ISO 668: 2013:

Series 1 Freight Containers - Classifications, dimensions and ratings

ISO 1496-1: 2013:

Series 1 Freight Containers - Specification and Testing - Part 1: General Cargo Containers for General Purposes

ISO 6346: 1995, with Amendment 3: 2012:

Freight Containers - Coding, Identification and marking

Reason:

This code change purpose is to introduce intermodal shipping containers into the International Building Code based on requests by code officials in the U.S. Prior to this proposal, several jurisdictions had created their own individual regulations or ordinances, or had administered additional requirements beyond the code (e.g. Section 104.11 "Alternative materials, design and methods of construction and equipment") so as to be comfortable to ensure a safe structure. This code change proposal is in response to those requests to develop a set of consistent code provisions which cover the minimum safety requirements, but which do not duplicate existing code provisions.

This proposal covers:

Creation of a new definition in order to separate the container from other I-code sections which refer to, but intentionally do not define, shipping containers,

Creating exceptions so to differentiate the intermodal shipping container from other code sections which could be interpreted as applying to intermodal shipping containers under other applications (e.g. temporary storage, relocatable buildings, energy storage facilities, and listed equipment),

Verification of containers construction, condition, and structural integrity to assist the structural engineer in the evaluation for building construction,

References to other sections concerning foundations, decay and termite control, crawlspace ventilation, roof assemblies, interior finishes, and joints/intersections.

Introduction of structural provisions unique to intermodal shipping containers and which do not duplicate the existing structural requirements, and

Addition of three ISO standards for reference.

Chapter 2 - New definition - A new definition has been created in order that these provisions can be adequately enforced and not confused the other multiple varieties of definitions of containers currently in the market.

Section 3114.1 - This represents the charging statement that outlines the requirements for containers, and list the appropriate exceptions with the I-codes in order to coordinate with other provisions that may appear similar in nature and where intermodal shipping containers could possibly be used in those other applications.

Section 3114.2 - Construction documents - These provision emphasize the material requirements as specified in this section.

Section 3114.3 - Verification - These provisions focus on the characteristics of the intermodal shipping container prior to it being repurposed. In this case the provisions require a straight forward inspection by an approved agency, and verification of the data plate which is normally found on intermodal shipping containers. There was an intent not to specify who the approved agency would be for two reasons; 1) so as to allow the code official or state law(s) to handle this aspect recognizing that in each jurisdiction their requirements may be different, and 2) to avoid dictating an international agreement onto jurisdictions that are currently employed by the shipping and container manufacturers worldwide today. In this case, the standards are regulated by the International Convention of Safe Containers (CSC) that have policies and procedures for inspecting containers worldwide. These procedures include policies for Approved

Continuous Examination Program (ACEP) at the time the container is used in production, and policies for third party inspection agencies. The list shown in this section is a extract from the ISO standard and serves as a reference of items to be verified in order to validate the type of container.

3114.4 through 3114.6 - While we have strived to focus on only those provisions that recognize the unique aspects of intermodal shipping containers, we felt that some direction references were appropriate. In this case specific pointers are provided to foundations, decay and termite control, crawlspace ventilation, and roof requirements addressing drainage and weather protection.

3114.7 - Joints and voids - This provision is provided to address the interstitial spaces that may be created when multiple intermodal shipping containers are connected or stacked, whereby that concealed space between the containers is protected to prevent fire and hot gasses from passing between containers.

Section 3114.8 - Structural - The structural provisions are divided into multiple categories, as follows: 1) the general characteristics for all containers; 2) engineered structural design; and 3) simplified method for single-unit stand-alone container.

3114.8.1 - Foundations or supports - Provisions have been included to outline the two options for securing the container; a foundation or the connection to another structure. This provision makes it clear that the load path anchorage is required for all containers and to ensure the designed performance provided by the remainder of the structural provisions.

3114.8.2 - Welds - An additional provision has been added to require that any new welds be designed and installed with welds of greater structural capabilities.

Section 3114.8.4 - Detailed structural analysis - The detailed analysis engineering approach represents the general engineering practice allowed for all other types of building constructions. For this section the engineer of record is allowed to practice as they normally would for any other building type. As may be noted much of this section requires submission through the alternative means and methods provisions in order to obtain a permit as information about intermodal shipping containers is not readily listed in the IBC provisions or referenced standards.

Section 3114.8.5 - Simplified analysis - The concept for the single container approach is to make the design and construction process simpler. The provisions include a strict listing of limitations for use of these provisions. The proposal also provides structural design information, and pre-established shear wall information that is contained in the ISO 1496-1 standard, which is used to design and construct intermodal shipping containers. The shear wall values were obtained from the ISO 1496-1 standard through engineering analysis using a factor of safety of 5. In addition, a provision was installed to limit the number and size of openings and service holes within the container, as well as to prevent building owners or designers from embellishing the size to something most engineers would define as an opening. This method is intended to address the simple structure approach and provide available information for use by the structural engineer to supplement their work.

Chapter 35 - Referenced Standards - Included with this proposal are three ISO standards which are relevant to the intermodal shipping container's construction. These standards are part of the industry standards regulated by the International Convention of Safe Containers (CSC) that have policies and procedures for inspecting containers worldwide.

BCAC - The International Code Council's Building Code Action Committee (BCAC) was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held open meetings and numerous workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes and the public comments. Related documentation and reports are posted on the BCAC website at: <http://www.iccsafe.org/cs/BCAC/Pages/default.aspx>.

The ICC Building Code Action Committee created a task group to facilitate the development of this proposal. Members of the assigned task group included representatives from: City of Long Beach, CA; County of Mecklenburg, NC; Modular Building Institute; American Iron and Steel Institute; Underwriters Laboratories; and the Portland Cement Association. Additional contacts included the State of California (Division of State Architect, Housing and Community Development), City of San Diego; City of Los Angeles, CA; City of Seattle; Clark County, NV; Falcon Structures, RADCO a Twining Company, SEABOX Company, FEMA ATC Seismic Code Support Committee, and other guests who provided their individual expertise.

Cost Impact

The code change proposal will decrease the cost of construction .

The code change proposal will decrease the cost of construction. This new code section will provide clarity on how to consistently design with, permit, and field inspect shipping containers that are repurposed for building construction. Current use of repurposed intermodal shipping containers requires the building owner or designee to submit through

the alternative means and methods administrative provisions.

Analysis: A review of the standards proposed for inclusion in the code, ISO 668, ISO 1496-1 and ISO 6346, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1586

G152-18

IBC: D102.2.5

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Building Code

Revise as follows:

D102.2.5 Structural fire rating. Walls, floors, roofs and their supporting structural members shall be not less than 1-hour fire-resistance-rated construction.

Exceptions:

1. Buildings of Type IV-HT construction.
2. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. Automobile parking structures.
4. Buildings surrounded on all sides by a permanently open space of not less than 30 feet (9144 mm).
5. Partitions complying with Section 603.1, Item 11.

Reason:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

This code change proposal will result in consistency with the purpose and scope which was to leave intact the current Type IV heavy timber provisions. The HT category was created to differentiate the three (3) new categories of “mass timber”, where HT represents the long established heavy timber category that has been in the ICC family of codes, and the predecessor legacy codes for decades.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
3308.4 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit <http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, please visit <http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Internal ID: 951

G153-18

IBC: SECTION H102, H102.1, 202, H105.2, H105.3, H105.4, H105.5, H109.2

Proponent: Richard Milne, representing self

2018 International Building Code

SECTION H102 DEFINITIONS

H102.1 General. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

Delete without substitution:

~~**COMBINATION SIGN.** A sign incorporating any combination of the features of pole, projecting and roof signs.~~

~~**DISPLAY SIGN.** The area made available by the sign structure for the purpose of displaying the advertising message.~~

Revise as follows:

~~**GROUND SIGN, MONUMENT OR ENCLOSED PYLON SIGN, also defined as a ground sign.** A billboard or similar type of sign that is supported by one or more uprights, poles or braces in or upon the ground other than a combination sign or pole sign, as defined by this code.~~ sign that is supported by an internal structure embedded in the ground, but has a full fascia covering or is created to rest entirely upon the ground. Definition to include all pre-fabricated EPS structures and similar prefabricated monument style signs. Ground signs are defined as a fully fabricated sign that extended to the ground. Ground signs can include EPS structures that rest upon the ground but are supported and anchored internally by embedded poles, or signs that are supported by an external structure that is clad or built to be an integral part of the sign design (a rock pillar on either side supporting the sign structure in between, so long as the sign structure touches the ground, as an example). Ground signs shall not exceed 10 feet in overall height. Internal or external supports shall be embedded into the ground to required local code depth.

~~**POLE SIGN-SIGN (Freestanding sign)** A sign wholly supported by a sign structure in the ground. Pole signs shall have visible supports to the main message area. Pole signs shall be no less than 36" from grade to bottom of sign or as local code dictates within sight triangles.~~

~~**ROOF SIGN.** A sign erected on or above a roof or parapet of a building or structure. Roof sign structures are to be supported entirely by an approved structure fastened to the roof deck or surrounding parapet.~~

H105.2 Permits, drawings and specifications. Where a permit is required, as provided in Chapter 1, construction documents shall be required. These documents shall show the dimensions, material and required details of construction, including loads, stresses and anchors.
All signs are required to be permitted where required.

Ground signs 32 square feet and under are not required to provide engineer drawings for load and stresses.

Pole signs 32 square feet and under and less than 12 feet to the top of the sign are not required to provide engineer drawings for load and stresses.

H105.3 Wind load. Signs shall be designed and constructed to withstand wind pressure as provided for in Chapter ~~16.16.~~

Ground signs 32 square feet and under and fully supported by an internal structure and resting on the ground are exempt from this section.

Pole signs 32 square feet and under and 12 feet or less to the top of the sign are exempt from this section.

Delete without substitution:

~~**H105.4 Seismic load.** Signs designed to withstand wind pressures shall be considered capable of withstanding earthquake loads, except as provided for in Chapter 16.16.~~

Revise as follows:

H105.5 Working stresses. In outdoor advertising display signs (billboards, freestanding signs or projecting signs over 32 square feet and above 20 feet from grade), the allowable working stresses shall conform to the requirements

of Chapter ~~16-16~~. The working stresses of wire rope and its fastenings shall not exceed 25 percent of the ultimate strength of the rope or fasteners.

Exceptions:

1. The allowable working stresses for steel and wood shall be in accordance with the provisions of Chapters 22 and ~~23-23~~.
2. The working strength of chains, cables, guys or steel rods shall not exceed one-fifth of the ultimate strength of such chains, cables, guys or steel.

H109.2 Required clearance. The bottom coping of every ~~ground~~ freestanding sign shall be not less than 3 feet (914 mm) above the ground or street level, ~~which space can be filled with platform decorative trim or light wooden construction or as defined by local codes within a working sight triangle.~~

Reason:

Inaccurate or overlapping definitions.



Pylon,
Freestanding,
Pole



Ground,
Monument



Cost Impact

The code change proposal will decrease the cost of construction .

For small sign shops (5 employees and under or under \$100K gross annual revenue) the current codes as defined require substantial investments with outside engineering firms for engineered drawings for signage that should not

require such drawings. As the current code stands, for example, I would need an engineered drawing for wind load, stresses and concrete psi ratings for something as small as 4 square feet on a single pole 6 feet from grade.

Internal ID: 137

G154-18

IBC: APPENDIX P (New), SECTION P101 (New), P101.1 (New), SECTION P102 (New), P102.1 (New), SECTION P103 (New), P103.1 (New), TABLE P103.1(1) (New), TABLE P103.1(2) (New), SECTION P104 (New), P104.1 (New), TABLE P104.1(1) (New), SECTION P105 (New), P105.1 (New), P105.1.1 (New), SECTION P106 (New), P106.1 (New), P106.1.1 (New), SECTION P107 (New), P107.1 (New), SECTION P108 (New), P108.1 (New), UL (New), CDPH (New)

Proponent: Ed Kullik (bcac@iccsafe.org)

2018 International Building Code

Add new text as follows:

APPENDIX P MATERIAL EMISSIONS

SECTION P101 GENERAL

P101.1 Scope. Site applied or installed adhesives and sealants, architectural coatings, floor, ceiling and wall assemblies and systems and insulation that are located on the interior side of the building envelope shall comply with Sections P102 through P107. Emission testing shall be performed by an ISO/IEC 17025 accredited laboratory that has the CDPH/EHLB/Standard Method v1.2, USEPA Method TO-17 and ASTM Standard Method D5197 within the scope of its accreditation. Approved agencies that are deeming products compliant with the product emission requirements shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of their accreditation.

SECTION P102 DEFINITIONS

P102.1 General. The following words and terms shall, for the purposes of this appendix, have the following meanings shown herein.

VOLATILE ORGANIC COMPOUND (VOC). A chemical compound based on carbon chains or rings that typically contain hydrogen and sometimes contain oxygen, nitrogen and other elements, and that has a boiling point in the range from (50°C to 100°C) to (240°C to 260°C).

SECTION P103 ADHESIVES AND SEALANTS

P103.1 General. Not less than 85 percent by weight or volume, of site-applied adhesives and sealants shall comply with the VOC content limits specified in Table P103.1(1) or the VOC emissions limits specified in Table P103.1(2). The VOC content adhesives, sealants and sealant primers shall be determined and limited in accordance with SCAQMD Rule 1168. HVAC duct sealants shall be classified as "Other" category within the SCAQMD Rule 1168 sealants table. The provisions of this section shall not apply to adhesives and sealants subject to state or federal consumer product VOC regulations. HVAC duct sealants shall be classified as "Other" category within the SCAQMD Rule 1168 sealants table.

Compliance with Table P103.1(2) shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method v1.2 and shall comply with the limit requirements for either office or classroom spaces, regardless of the space type.

Exceptions: The following solvent welding and sealant products are not required to comply with the emissions or the VOC content requirements of this section

1. Cleaners, solvent cements and primers used with plastic piping and conduit in plumbing, fire suppression and electrical systems.
2. HVAC air duct sealants where the air temperature of the space in which they are applied is less than 40°F (4.5°C).

TABLE P103.1(1)
SITE APPLIED ADHESIVE AND SEALANT VOC LIMITS ^{a, b}

Adhesive	VOC Limit g/l
Indoor carpet adhesives	50
Carpet Pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesive	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural Sealant Primer	
Non-porous	250
Porous	775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact Adhesive	80

<u>Special Purpose Contact Adhesive</u>	<u>250</u>
<u>Structural wood member adhesive</u>	<u>140</u>

a. VOC limit less water and less exempt compounds in grams/liter (g/l)

b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in SCAQMD Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.

TABLE P103.1(2)
VOC EMISSION LIMITS

VOC	LIMIT
Individual VOC's	<1/2 CA chronic REL ^a
Formaldehyde	< 9 µg/m ³ or < 7 ppb

a. CDPH/EHLB/Standard Method v1.2 Chronic Reference Exposure Level (CREL).

SECTION P104 ARCHITECTURAL COATINGS

P104.1 General. Not less than 85 percent of the weight or volume of site-applied architectural coatings specified in this section shall comply with either VOC content limits established in Table P104.1(1) or the VOC emissions limits in Table P103.1(2)

1. Anticorrosive coatings.
2. Basement specialty coatings.
3. Concrete/masonry sealers.
4. Concrete curing compounds.
5. Dry fog coatings.
6. Faux finish coatings.
7. Fire-resistive coatings.
8. Flat and non-flat topcoats.
9. Floor coatings.
10. Graphic arts (sign) coatings.
11. High-temperature coatings.
12. Industrial maintenance coatings.
13. Low solids coatings
14. Mastic texture coatings
15. Metallic pigmented coatings.
16. Multicolor coatings.
17. Pretreatment wash primers.
18. Primers
19. Reactive penetrating sealers.
20. Recycled coatings.
21. Shellacs, clear and opaque.
22. Specialty primers.
23. Stains
24. Stone consolidants.
25. Swimming pool coatings.
26. Tub- and tile-refining coatings.
27. Under coaters.
28. Waterproofing membranes.
29. Wood coatings including clear wood finishes.
30. Wood preservatives.
31. Zinc primers.

Compliance with Table P103.1(2) shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method v1.2 and shall comply with the limit requirements for either office or classroom spaces of the space type.

TABLE P104.1(1)
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS ^{a,b}

<u>Coating Category</u>	<u>Limit^c g/l</u>
<u>Flat coatings</u>	<u>50</u>
<u>Non-flat coatings</u>	<u>100-</u>
<u>Non-flat high gloss coatings</u>	<u>250</u>
<u>Aluminum roof coatings</u>	<u>400</u>
<u>Basement specialty coatings</u>	<u>400</u>
<u>Bituminous roof coatings</u>	<u>50</u>
<u>Bituminous roof primers</u>	<u>350</u>
<u>Bond breakers</u>	<u>350</u>
<u>Concrete curing compounds</u>	<u>350</u>
<u>Concrete/masonry sealers</u>	<u>100</u>
<u>Driveway sealers</u>	<u>50</u>
<u>Dry fog coatings</u>	<u>150</u>
<u>Faux finishing coatings</u>	<u>350</u>
<u>Fire resistive coatings</u>	<u>350</u>
<u>Floor coatings</u>	<u>100</u>
<u>Form-release compounds</u>	<u>250</u>
<u>Graphic arts (sign) coatings</u>	<u>500</u>
<u>High temperature coatings</u>	<u>420</u>
<u>Industrial maintenance coatings</u>	<u>250</u>
<u>Low solids coatings</u>	<u>120^d</u>
<u>Magnesite cement coatings</u>	<u>450</u>
<u>Mastic texture coatings</u>	<u>100</u>
<u>Metallic pigmented coatings</u>	<u>500</u>
<u>Multi-color coatings</u>	<u>250</u>
<u>Pre-treatment wash primers</u>	<u>420</u>
<u>Primers, sealers and undercoaters</u>	<u>100</u>
<u>Reactive penetrating sealers</u>	<u>350</u>
<u>Recycled coatings</u>	<u>250</u>
<u>Roof coatings</u>	<u>50</u>
<u>Rust Preventative Coatings</u>	<u>250</u>
<u>Shellacs, clear</u>	<u>730</u>
<u>Shellacs, opaque</u>	<u>550</u>
<u>Specialty primers and sealers</u>	<u>100</u>
<u>Stains</u>	<u>250</u>
<u>Stone Consolidants</u>	<u>450</u>
<u>Swimming pool coatings</u>	<u>340</u>
<u>Traffic marking coatings</u>	<u>100</u>
<u>Tub and tile refinish coatings</u>	<u>420</u>
<u>Waterproof membranes</u>	<u>250</u>
<u>Wood coatings</u>	<u>275</u>
<u>Wood preservatives</u>	<u>350</u>
<u>Zinc-rich primers</u>	<u>340</u>

- a. The specified limits remain in effect unless revised limits are provided in subsequent columns of the table.
- b. Table P104.1(1) architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings.
- c. Limits are expressed as VOC Regulatory (except as noted) thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
- d. Limit is expressed as VOC actual.

SECTION P105 FLOORING

P105.1 General. A minimum of 85 percent of the total area of flooring installed within the interior of the building shall comply with the VOC limits in Table P103.1(2). Where flooring with more than one distinct product layer is installed, the emissions from each layer shall comply with these requirements. Compliance with Table P103.1(2) shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method v1.2 and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

P105.1.1 Deemed to comply. Floor covering materials that are composed of the following materials shall be deemed to comply with the VOC emission limits in Table P103.1(2). Where these products include integral organic-based surface coatings, binders or sealants or are installed using adhesives, sealants, paints or coatings, those products shall be subject to other requirements of this appendix.

1. Ceramic and concrete tile.
2. Natural stone.
3. Gypsum plaster.
4. Concrete masonry.
5. Clay masonry.
6. Metal.

SECTION P106 CEILING AND WALL ASSEMBLIES AND SYSTEMS

P106.1 General. A minimum of 85 percent of the total area of ceiling and wall assemblies and systems installed shall comply with VOC limits in Table P103.1(2). Where assemblies and systems have more than one distinct product layer are installed, the emissions from each layer shall comply with these requirements. Compliance with Table P103.1(2) shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method v1.2 and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

P106.1.1 Deemed to comply. Ceiling and wall assembly and system materials that are composed of the following materials shall be deemed to comply with the VOC limits in Table P103.1(2). Where these products include integral organic-based surface coatings, binders or sealants or are installed using adhesives, sealants, paints or coatings, those products shall be subject to other requirements of this appendix.

1. Ceramic and concrete tile.
2. Natural stone.
3. Gypsum plaster.
4. Concrete masonry.
5. Clay masonry.
6. Metal.

SECTION P107 INSULATION

P107.1 General. Not less than 85 percent of insulation, by square feet, installed shall comply with the VOC limits in Table P103.1(2). Compliance with Table P103.1(2) shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method v1.2 and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

Add new standard(s) follows:

SECTION P108 REFERENCED STANDARDS CDPH

California Department of Public Health, 850 Marina Bay Parkway, Richmond, CA 94804

CDPH/EHLB/Standard Method v1.2' Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2"; January 2017, California Department of Public Health.

ISO

International Organization for Standardization, Chemin de Blandonnet 8, CP401, 1214 Vernier, Geneva, Switzerland

ISO/IEC 17025-05 General Requirements for the Competence of Testing and Calibration Laboratories.

ISO/IEC 17065-12 Requirements for bodies certifying products, processes and services.

EPA

U.S. Environmental Protection Agency, Stationary Source Compliance Divisions, Washington D.C.

US EPA Method TO-17 (issued 1/1999) Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling on to Sorbent Tubes.

ASTM

ASTM D5197-16 Standard Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)

SCAQMD

South Coast Air Quality Management District, 21865 Copley Drr. Diamond Bar, CA 91765

Rule 1168-1989 Adhesive and Sealant Applications, with amendments through January 7, 2005.

CEPA

California Environmental Protection Agency, Air Resources Board, 1001 I Street, Sacramento, CA 95814

Suggested Control Measures for Architectural Coatings, February 1, 2008.

P108.1 General.

UL Underwriters Laboratories 36y8082130231- the standard title

CDPH California Department of Public Health, 850 Marina Bay Parkway, Richmond, CA 94804
CDPH California Department of Public Health, 850 Marina Bay Parkway, Richmond, CA 94804

CDPH/EHLB/Standard Method v1.2' Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2"; January 2017, California Department of Public Health.

Reason:

In the last couple of decades our building codes have pushed for tighter building envelopes, more efficient and mechanical ventilation, with the goal of conserving energy and preserving water tightness. But this changes the indoor environment to a potentially adverse environment for occupants. Good indoor air quality (IAQ) is predicated on three factors, correct ventilation, correct filtration, and source control. As our codes have evolved we've done well to focus on the first two (correct ventilation and filtration), but have not sufficiently addressed source control. Various materials we regularly use in the construction and fit out of our buildings have emissions of volatile organic compounds (VOC). Limiting the emissions to an acceptable level has been established as the method for source control.

The material emission requirements detailed in this proposal are based on commonly found VOC in our indoor environment that can come off of products. The California Office of Environmental Health Hazard Assessment (CA OEHHA) and California Department of Public Health (CDPH) developed the list of 35 individual VOC that are in each requirement. Numerous studies from around the globe show that exposure to high levels of some of the commonly found VOC detailed in these requirements can cause not only severe discomfort, but headaches, nose bleeds, increased asthma attacks, the onset of asthma, and potential long-term health effects. Some of these studies even show that continued exposure to some of these VOC can lead to an increase in C-reactive protein levels in human subjects, which is the body's response to inflammation.

Section 101.3 of the IBC, states, "The purpose of this code is to establish the minimum requirements to provide a reasonable level of safety, public health and general welfare...". With the potential issues indoor occupants can receive due to poor indoor air quality, the intent of the IBC implores us to put source control in to protect public health and general welfare. Chapter 12 of the IBC governs the Interior Environment and has provisions for ventilation and

surrounding materials associated with the interior spaces of buildings.

Many different stakeholder groups, including but not limited to, researchers, health officials, manufacturers, laboratories, and governmental representatives, have been involved in the development of the referenced test methods, many of the studies, and in the codification of these requirements previously. North American and many global manufacturers have embraced the lowering of emissions in the name of source control and there are thousands of product that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code officials, designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own.

Builders will be able to show compliance in much the same way as they show compliance to many other fire, electrical, and other safety requirements in the codes. As with those other requirements, there are numerous laboratories around the globe that meet the qualifications to perform the tests required in this proposal. Numerous ISO 17065 accredited third-parties around the globe also supply certifications that prove compliance to these requirements as well, so code officials have approved agencies that they already use and trust to help them prove compliance to these parameters.

These requirements have been in the International Green Construction Code (IgCC) and ASHRAE 189.1 since their inception and hundreds of authorities having jurisdictions already have these requirements in place, from large cities such as Washington DC, Dallas, TX, or Baltimore, MD to smaller jurisdictions such as Merced, CA, Scottsdale, AZ, Carbondale, CO, North Bend, WA, and Boynton Beach, FL. Products are available throughout the nation and builders are aware of how to find these products and show compliance to these requirements. As these types of requirements have been in green building codes and ratings systems for over a decade most North American manufacturers have many if not all of their products compliant with the requirements detailed above.

The 85% level detailed in the requirements was originally put in to the other code documents in recognition of the nature of construction. Some of the products in the requirements are products that are common from project to project and sometimes construction teams will utilize a little of the left over product from previous projects to complete a new project. While this is not ideal for the potential emissions emitted into the indoor environment, the overall impact of having to rip out all of the potentially impacted products for the small potential amount of emissions from the up to 15% of non-compliance products.

Some of the products detailed below are deemed not to need permits in the IBC and therefore may not be seen by the code official, but IBC 105.2 states, "Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction." If there is a potential issue for indoor occupants the code should still cover it even if an AHJ decides that it doesn't want to require documentation to detail compliance as the Intent detailed in Section 101.3 of the IBC brings us back to ensure health and general welfare. Including these minimum material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

The proposal adds new reference standard to Chapter 35 which have been previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

In closing, the reasons for these requirements are:

As our building and energy codes require tighter and tighter buildings with less and less air changes, we need to ensure that all three pillars of good indoor air quality are addressed in codes.

Almost all North American manufacturers have products that already show compliance to these requirements, but some of our most recent issues have come with some products brought in from overseas.

Providing a reasonable level of safety, public health and general welfare is the stated purpose of this code. With the availability of products, ease of compliance review, and potential improvements in the indoor environment, these requirements fit the purpose of the IBC without extraordinary burden to any of the levels of building.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). The proposal was brought to the BCAC by the ICC Sustainability, Energy, High Performance Code Action Committee (SEHPCAC). Both CACs were established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC and SEHPCAC have each held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.

Bibliography:

Studies or Statements:

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Standards

California Department of Public Health

850 Marina Bay Parkway

Richmond, CA 94804

CDPH/EHLB/Standard Method V1.2 “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2” dated January 2017, California Department of Public Health

(http://berkeleyanalytical.com/sites/default/files/CDPH-IAQ_StandardMethod_V1_2_2017.pdf)

ISO

ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories...(<https://www.iso.org/standard/39883.html>)

ISO/IEC 17065:2012 Requirements for bodies certifying products, processes and services
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U. S. Environmental Protection Agency

Stationary Source Compliance Division

Washington, D.C.

US EPA Method TO-17 (issued 1/1999) Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes (<https://www3.epa.gov/ttnamti1/files/ambient/airtox/to-17r.pdf>)

ASTM

ASTM D5197-16 - Standard Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology) (<https://www.astm.org/Standards/D5197.htm>)

South Coast Air Quality Management District

21865 Copley Dr

Diamond Bar, CA 91765

Rule 1168-1989 Adhesive and Sealant Applications, with amendments through January 7, 2005.....
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California Environmental Protection Agency

Air Resources Board

1001 I Street

Sacramento, CA 95814

California Air Resources Board Suggested Control Measure for Architectural Coatings, February 1, 2008
(https://www.arb.ca.gov/coatings/arch/Approved_2007_SCM.pdf)

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

No impact should happen as these requirements have been in building codes and rating systems for over a decade. Due to this most manufacturers have products that meet these requirements already. In fact numerous manufacturers don't make a product that doesn't meet these requirements.

Analysis: A review of the new standards proposed for inclusion in the code, ISO/IEC 17065-12 and USEPA Method TO-17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

The other standards referenced in the changes by this proposal, ISO/IEC 17025, CDPH/EHLB Standard Method v1.2, ASTM D5197, SCAQMD Rule 1168 and CEPA Suggested Control Measures for Architectural Coatings, are currently referenced in other I-Codes.

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