FS107-21

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

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

2021 International Building Code

Add new text as follows:

SECTION 723 STRUCTURAL FIRE ENGINEERING.

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

Reason Statement: American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) has developed industry consensus on performance-based structural fire design within the ASCE/SEI 7 standard [1] as demonstrated in their freely-available ASCE/SEI Design Guide (Performance-Based Structural Fire Design: Exemplar Designs of Four Regionally Diverse Buildings using ASCE 7-16, Appendix E) [2]. For the first time in U.S. practice, this standard establishes the process that enables designers to upgrade structures (e.g., structural connections) to be intrinsically safer to fire effects (e.g., restrained thermal expansion/contraction and large deflections) in order to better protect building occupants and firefighters from structural collapse due to uncontrolled fire events. Also, the standard is structured to formally integrate building officials into the design process in a similar manner as performance-based structural engineering is conducted for other design hazards (e.g., blast, seismic, and wind). In summary, this code change proposal adds the appropriate reference to the ASCE/SEI 7 standard for performance-based structural fire design.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Bibliography: [1] ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures, Appendix E: Performance-Based Design Procedures for Fire Effects on Structures, American Society of Civil Engineers: Structural Engineering Institute, 2016
[2] ASCE/SEI Performance-Based Structural Fire Design: Exemplar Designs of Four Regionally Diverse Buildings using ASCE 7-16, Appendix E, American Society of Civil Engineers: Structural Engineering Institute and Charles Pankow Foundation, 2020 < https://ascelibrary.org/doi/book/10.1061/9780784482698 >

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change would have no direct impact on construction costs since alternative methods are already being conducted in practice and the performance-based structural fire design procedures in ASCE/SEI 7 represent current industry best practices.

FS1-21

IBC: 703.2

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2 Fire resistance. The *fire-resistance rating* of *building elements*, components or assemblies shall be determined in accordance with ASTM E119 or UL 263. Fire-resistance ratings shall also be determined in accordance Section 703.2.1 or 703.2.2 without the use of *automatic* sprinklers or any other fire suppression system being incorporated, or in accordance with Section 703.2.3.

Reason Statement: During the 2021 IBC development process, the ASTM E119 and UL 263 standards were omitted from a major floor modification made during the hearings.
The charging language for this section has had ASTM E119 and UL 263 referenced since the inception of the IBC. Secondly, the definition of fire-resistance rating states, "*The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a structural function, or both, as determined by tests, or methods based on tests, prescribed in Section 703*."

Note that the IBC Ch. 2 definition states, "*methods based on tests",* which is the basis for determining fire-resistance. The test referred to is ASTM E119 or UL 263. This code proposal provides direction to use the 100 years of fire-testing from which to build approvals for fire-resistance, regardless of method.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code proposal references the basis for developing fire-resistance used for over 100 years.

FS1-21

Committee Action: **Disapproved**

Committee Reason: The committee indicated that ASTM E119 or UL 263 were not missed from section 703.2. Section 703.2 refers to subsections that include ASTM E119 or UL 263. The committee also discussed that adding "determined in accordance" to the charging language creates confusion. (Vote: 10-3)

FS2-21

IBC: 703.2.1

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.1 Tested assemblies. A *fire-resistance rating* of *building elements,* components or assemblies shall be determined by the test procedures set forth in ASTM E119 or UL 263 using loaded horizontal building elements and assemblies meeting the minimum size requirements in the standard . The *fire-resistance rating* of penetrations and *fire-resistant joint systems* shall be determined in accordance with Sections 714 and 715, respectively.

Reason Statement: Fire testing is very technical. The technical details about how fire tests are conducted are part of the standards; ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* and UL 263 *Fire Tests of Building Construction and Materials.* The purpose of this code proposal is to bring clarity to code users about a key point that is in the standards, that is critical to building safety.
The key words from the standard in this proposal can help code officials evaluate compliance with the code during plan review and approval. These few words added to the code highlight a very important concept from ASTM E119 and UL 263 - applying a load to the horizontal building elements (beams) and also horizontal assemblies (floors or roofs) and also full scale testing rather than small scale testing.

We have heard from the field that products tested in accordance with a "*modified"* ASTM E119 or UL 263 fire test are being submitted and approved as code compliant, yet don't comply with the code. The "*modification"* to the fire-test standards are to remove the load applied and use a small sample size. This results in passing fire tests at less thickness, causing a safety risk. Removing the weight resistance - a load - during the fire test, and using a smaller sample size are violations of the ASTM E119 and UL 263 fire test standards.

If there is not a load applied and not using full scale testing as required by the ASTM E119 and UL 263 standards, we have no idea how the products will perform in the field. Adding the words - 'loaded horizontal building elements and assemblies meeting the minimum size requirements specified in the standards ' - is short, and sets up the questions that the code official can ask to evaluate fire-resistance protection submitted during the approval process. In order to bring consistency to the code requirements, we have added it in each of the new sections added to the '21 code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will deliver what the code requires to the building owner and manager.

FS2-21

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposal is problematic regarding the loaded horizontal building elements and assemblies. The committee mentioned that the proposed text is already covered by ASTM E119 and UL 263. (Vote: 12-1)

FS4-21

IBC: 703.2.2

Proponents: Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

703.2.2 Analytical methods. The fire resistance of *building elements*, components or assemblies established by an analytical method shall be by any of the methods listed in this section, based on the fire exposure and acceptance criteria with loaded horizontal building elements and assemblies specified in ASTM E119 or UL 263.

1. *Fire-resistance* designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated *building elements*, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of *building element,* component or assemblies designs having *fire-resistance ratings* as determined by the test procedures set forth in ASTM E119 or UL 263.
5. *Fire-resistance* designs certified by an *approved* agency.

Reason Statement: ASTM E119 and UL 263 are very detailed standards with the purpose of determining fire-resistance-ratings for building elements and assemblies. Fire testing conducted in accordance with ASTM E119 and UL 263 is used to prove performance of building elements and assemblies protected with fire-resistive materials. The purpose of this code proposal is to clarify that when developing an analytical method for fire-resistance, ASTM E119 and UL 263 standards - without modifications and with load applied - are to be factored in the analysis. Determining fire-resistance-ratings needs to be performed without modifications to the stated standards to be consistent with 703.2.1, Tested Assemblies.
These few words - with load applied to horizontal building elements and assemblies - give the code official the questions to ask when analytical methods are submitted for approval for fire-resistance-ratings of horizontal building elements and assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
If approved, this code proposal will assure that critical aspects of ASTM E119 and UL 263 are included in the analytical methods.

FS4-21

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as requested by the proponent and based on the committee's action on FS2-21. (Vote: 13-0)

FS5-21

IBC: 703.2.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.3 Approved alternate method. The *fire resistance* of *building elements*, components or assemblies not complying with Section 703.2.1 or 703.2.2 shall be permitted to be established by an alternative protection method based on a comparison of designs having *fire-resistance ratings* as determined by the test procedures as set forth in ASTM E119 or UL 263 and *approved* in accordance with Section 104.11.

Reason Statement: When providing an alternate method to determine fire resistance, there needs to be a justification for the claims made in the alternate method. To prove fire resistance of building elements and assemblies, the basis from which to draw conclusions needs to incorporate comparisons with ASTM E119 and UL 263. There are thousands of fire tests with multiple choices in each design from which to base alternate method approval in the UL Product iQ, Intertek and other fire-resistance directories providing ample opportunity to compare for alternate method development. The fire testing database has over 100 years of experience from which to draw conclusions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not increase cost of construction. Instead, it will assure alternative methods use publicly available information to prove performance.

FS5-21

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposed text is already addressed in section 703.2.2 option 4. The proposed text takes away possible options. The proposal also includes unnecessary restrictions on alternative methods. (Vote: 13-0)

FS6-21

IBC: 703.2.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

703.2.3 Approved alternate method. The *fire resistance* of *building elements*, components or assemblies not complying with Section 703.2.1 or 703.2.2 shall be permitted to be established by an alternative protection method in accordance with Section 104.11 or ASCE/SEI 7 Appendix E, performance-based structural fire design and comparing information based on testing in accordance with ASTM E119 or UL 263.

Reason Statement: The purpose of this proposal is to provide the AHJ a new additional standard basis from which to approve alternative methods for fire-resistance. In addition to section 104.11 of the IBC, the new ASCE/SEI 7 Appendix E, when used in combination with knowledge gained from 100 years of fire testing in accordance with ASTM E119 and UL 263, provides the code official a quantitative way - the data fire-resistance directories and test reports, to evaluate and approve an alternative method for fire-resistance ratings in buildings. When using a fire-resistance test report or directory, in addition to the performance based structural fire design analysis, we gain better fire safety in buildings through use of research and testing knowledge. Plus, this new ASCE/SEI 7 Appendix E provides a standard from which the code official can develop their approval of the alternate method.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides another option for the code official to use when approving an alternate method in accordance with 104.11.

FS6-21

Committee Action: **Withdrawn**

FS11-21

IBC: 704.6.1

Proponents: Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

704.6.1 Secondary attachments to structural members. Where primary and secondary structural steel members require fire protection, secondary tubular steel attachments to those structural members shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches (305 mm), or shall be applied to the entire length where the attachment is less than 12 inches (305 mm) long. Where an attachment is hollow and the ends are open, the fire-resistive material and thickness shall be applied to both exterior and interior of the hollow steel attachment.

Reason Statement: We applaud the proponent that added this new section for fire-resistance-rated protection of secondary steel attachments to structural steel building elements. While we supported the original proposal that dealt with only tubular steel secondary attachments, we believe the approved Public Comment far exceeds the 2018/2019 Fire Safety Committee's Action to protect only tubular - substantial attachments - to the secondary structural frame. It extends the protection to ANY steel attachments to the primary and secondary structural frame of the building. The new code language means that thin hanger wire that holds up ceiling grid and other items such as ½" or less threaded rod that also holds up items above ceilings must be protected with fire-resistive materials of thickness equal to or greater than the attachments.

Experts in fire resistance testing from a major testing laboratory and suspended ceiling manufacturer have stated "heat transfer from hanger wires or small rods have never melted or caused failure of the secondary members to which they are attached. The wires and rods elongate during the fire test, but remain through the end of the fire-tests." These experts also state that in fire tests of assembles where ceiling panels or gypsum panels are used, the wires and rods melt when the assembly eventually fails. These attachments are not substantial steel items that make a difference to the building fire safety - but are now are required to have 12" of protection.

To protect wires and rods for 12" means some kind of wire mesh cage must be fabricated around the wire or rod to allow the fireproofing thickness to build and provide required protection. This new requirement – that does extend to thin 12ga. hanger wire and small threaded rods – adds unjustified cost to the project without proof that it adds to safety.

Finally, there is no tested and listed system design in the UL Product iQ currently that requires 12" protection of threaded rods or ceiling hanger wire. That's why we request reverting back to the original proposal prior to the PCH last cycle, which refers to only tubular attachments that can cause problems on the structure.

Cost Impact: The code change proposal will decrease the cost of construction
The cost impact will be that the small attachments defined in the proposal will not require protection, reducing costs significantly. The amount of reduction varies based on the number of small attachments, the presence of a hanging ceiling with metal grid and ceiling tiles, or other building service items such as ducts, cables and pipes, that might hang from a fire-resistance-rated assembly. .

FS11-21

Committee Action: **As Modified**

Committee Modification:

704.6.1 Secondary attachments to structural members

Where primary and secondary structural steel members require fire protection, ~~secondary tubular steel attachments to those structural members~~ any additional structural steel members having direct connection to the primary structural frame or secondary structural members shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches (305 mm), or shall be applied to the entire length where the attachment is less than 12 inches (305 mm) long. Where an attachment is hollow and the ends are open, the fire-resistive material and thickness shall be applied to both exterior and interior of the hollow steel attachment.

Committee Reason: The committee deemed the modification is capturing what was missing from the original proposal. The committee also concluded that the reason statement is convincing that a modifier is needed before steel attachments. The committee encouraged the proponent to work with other suggested additions in the public comment phase, including addressing the word "structural" and addressing the heat transfer issue. (Vote: 13-0)

G17-21

IBC: SECTION 202, 603.1, 722.5.1.3, 722.5.2.2, 722.5.2.3, [BF] 1705.16

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

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

2021 International Building Code

Revise as follows:

[BF] INTUMESCENT FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS ~~COATINGS~~. ~~Thin film~~ | Liquid mixture applied to substrates by brush, roller, spray or trowel which expands into a protective foamed layer to provide fire- resistive ~~resistant~~ protection of the substrates when exposed to flame or intense heat.

Delete without substitution:

~~[BF] MASTIC FIRE-RESISTANT COATINGS~~. ~~Liquid mixture applied to a substrate by brush, roller, spray or trowel that provides fire-resistant protection of a substrate when exposed to flame or intense heat.~~

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.

9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent fire-resistive materials ~~and mastic resistant coatings~~, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

722.5.1.3 Sprayed fire-resistant materials. The *fire resistance* of wide-flange structural steel columns protected with sprayed fire-resistant materials, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1(W/D) + C_2]h \quad \textbf{(Equation 7-13)}$$

where:

R = *Fire resistance* (minutes).

h = Thickness of sprayed fire-resistant material (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.2.2 Sprayed fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with sprayed fire-resistant materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the fire-resistant material is adjusted in accordance with the following expression:

$$h_2 = h_1 [(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60] \quad \textbf{(Equation 7-17)}$$

where:

h = Thickness of sprayed fire-resistant material in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistant material thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistant material.

The *fire resistance* of structural steel beams and girders protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

722.5.2.3 Structural steel trusses. The *fire resistance* of structural steel trusses protected with fire-resistant materials sprayed to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-resistant material shall be determined in accordance with Section 722.5.1.3. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 722.5.1.1. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that directly support floor or roof assembly shall be determined on the same basis as beams and girders, as specified in Section 722.5.2.1.

The *fire resistance* of structural steel trusses protected with intumescent fire-resistive materials ~~or mastic fire-resistant coatings~~ shall be determined on the basis of *fire resistance* tests in accordance with Section 703.2.

[BF] 1705.16 ~~Mastic and intumescent~~ Intumescent fire~~-resistant coatings~~ resistive materials. *Special inspections* and tests for ~~mastic and~~ *intumescent fire~~-resistant coatings~~* resistive materials applied to structural elements and decks shall be performed in accordance with AWCI 12-B. *Special inspections* and tests shall be based on the fire-resistance design as designated in the *approved construction documents*. *Special inspections* and tests shall be performed during construction. Additional visual inspection shall be performed after the rough installation and, where applicable, prior to the concealment of electrical, automatic sprinkler, mechanical and plumbing systems.

Reason Statement: The purpose of this code proposal is consolidate two definitions for the same material into one term.
In researching for this code proposal, the IBC defines both terms, then uses a combined term - intumescent or mastic intumescent coatings - in the technical sections. That's why we are proposing the change to the definition. These materials purpose and usage is to provide fire-resistive protection. This new combined name and definition incorporates both the mastics and coatings, providing a place in the code for these products so it can be referred to as one name, and found in one definition. Finally, the Webster's Dictionary definition for 'resistive' is .... "marked by resistance - often used in combination // fire-*resistive* material." The term "Intumescent Fire-Resistive Materials" (IFRM) is also the term used for these products in the NFCA's Handbook of Accepted Fireproofing Knowledge and UL has changed their fire-resistance directory (UL Product iQ).

One note, we have deleted the words 'Thin Film'. While it is nice to have this in marketing literature, it is difficult to define thin and thick materials. The remaining 'liquid mixture', and 'applied by brush, roller, spray or trowel', do not limit thickness to thick or thin materials. The materials are Intumescent Fire-Resistive Materials meant for fireproofing, and the reason for this code change proposal.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a definition change without technical requirements, it will not increase or decrease the cost of construction.

G17-21

G17-21

Committee Action: **As Modified**

Committee Modification:

[BF] INTUMESCENT FIRE-RESISTIVE MATERIALS. Liquid mixture applied to substrates by brush, roller, spray or trowel which expands into a protective insulating ~~foamed~~ layer to provide fire-resistive protection of the substrates when exposed to flame or intense heat.

722.5.1.3 Sprayed fire-resistive ~~fire-resistant~~ materials. The *fire resistance* of wide-flange structural steel columns protected with sprayed fire-resistive ~~fire-resistant~~ materials, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$R = [C_1 (W / D) + C_2] h$
(Equation **7-13**)
where:

R = *Fire resistance* (minutes).

h = Thickness of sprayed fire-resistive ~~fire-resistant~~ material (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent fire-resistive materials shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.2.2 Sprayed fire-resistive ~~fire-resistant~~ materials. The provisions in this section apply to structural steel beams and girders protected with sprayed fire-resistive ~~fire-resistant~~ materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the fire-resistive ~~fire-resistant~~ material is adjusted in accordance with the following expression:

$h_2 = h_1 [(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60]$
(Equation **7-17**)
where:

h = Thickness of sprayed fire-resistive ~~fire-resistant~~ material in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistive ~~fire-resistant~~ material thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistive ~~fire-resistant~~ material.

The *fire resistance* of structural steel beams and girders protected with intumescent fire-resistive materials shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

Committee Reason: The committee determined the modification uses "insulating" instead of "foamed", which is the proper word. The modification also clarifies the code and consistent with the latest code change using "fire-resistive" instead of "fire-resistant". The proposal is a good clarification and updates the code language with the proper industry terms. (Vote: 12-1)

G29-21

IBC: SECTION 202, 403.2.3, 412.2.1.3, 603.1, 704.13, FIGURE 722.5.1(5), 722.5.1.1, 722.5.1.3, 722.5.1.3.2, 722.5.2.2, [BF] 1705.15, [BF] 1705.15.2, [BF] 1705.15.4, [BF] 1705.15.4.1, [BF] 1705.15.4.2, [BF] 1705.15.4.5, [BF] 1705.15.5, [BF] 1705.15.6, [BF] 1705.15.6.1, [BF] 1705.15.6.2, [BF] 1705.15.6.3

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

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

2021 International Building Code

Revise as follows:

[BF] SPRAYED FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS. Cementitious or fibrous materials that are sprayed to provide fire-resistant protection of the substrates.

403.2.3 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.3.

412.2.1.3 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The bond strength of the SFRM installed in airport traffic control towers shall be in accordance with Section 403.2.3 where the control cab is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A*roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.

9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistive ~~resistant~~ materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

704.13 Sprayed fire-resistive ~~resistant~~ materials (SFRM). ~~Sprayed fire-resistant materials (SFRM)~~ SFRM shall comply with Sections 704.13.1 through 704.13.5.

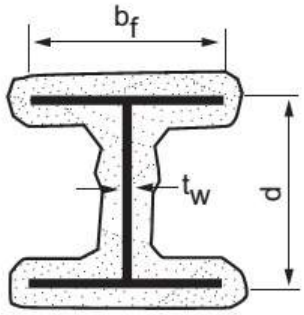

FIGURE 722.5.1(5)
WIDE FLANGE STRUCTURAL STEEL COLUMNS WITH SPRAYED FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS

722.5.1.1 General. These procedures establish a basis for determining the fire resistance of column assemblies as a function of the thickness of fire-resistant material and, the weight, W, and heated perimeter, D, of structural steel columns. As used in these sections, W is the average weight of a structural steel column in pounds per linear foot. The heated perimeter, D, is the inside perimeter of the fire-~~resistant~~ resistive material in inches as illustrated in Figure 722.5.1(1).

722.5.1.3 Sprayed fire-resistive ~~resistant~~ materials. (SFRM). The *fire resistance* of wide-flange structural steel columns protected with SFRM ~~sprayed fire resistant materials~~, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1(W/D) + C_2]h \quad \textbf{(Equation 7-13)}$$

where:

R = *Fire resistance* (minutes).

h = Thickness of SFRM ~~sprayed fire-resistant material~~ (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.1.3.2 Identification. Sprayed fire- resistive ~~resistant~~ materials shall be identified by density and thickness required for a given *fire-resistance rating*.

722.5.2.2 Sprayed fire-resistive ~~resistant~~ materials (SFRM). The provisions in this section apply to structural steel beams and girders protected with (SFRM) ~~sprayed fire-resistantmaterials~~. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the~~ fire-resistant~~ SFRM material is adjusted in accordance with the following expression:

$$h_2 = h_1 \left[(W_1 / D_1) + 0.60\right] / \left[(W_2 / D_2) + 0.60\right] \quad \textbf{(Equation 7-17)}$$

where:

h = Thickness of ~~sprayed fire-resistant~~ SFRM ~~material~~ in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and ~~fire-resistant material~~ SFRM thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of SFRM~~fire-resistant material~~.

The *fire resistance* of structural steel beams and girders protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

[BF] 1705.15 Sprayed fire-resistive ~~resistant~~ materials (SFRM). *Special inspections* and tests of SFRM ~~sprayed fire-resistant materials~~ applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.15.1 through 1705.15.6. *Special*

inspections shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed during construction with an additional visual inspection after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, and before concealment where applicable. The required sample size shall not exceed 110 percent of that specified by the referenced standards in Sections 1705.15.4.1 through 1705.15.4.9.

[BF] 1705.15.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected by the *special inspector* before the application of the SFRM ~~sprayed fire-resistant material~~.

[BF] 1705.15.4 Thickness. Not more than 10 percent of the thickness measurements of the ~~sprayed fire-resistant materials~~ SFRM applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the *approved* fire-resistance design, and none shall be less than the minimum allowable thickness required by Section 1705.15.4.1.

[BF] 1705.15.4.1 Minimum allowable thickness. For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E605. Samples of the SFRM ~~sprayed fire-resistant materials~~ shall be selected in accordance with Sections 1705.15.4.2 and 1705.15.4.3.

[BF] 1705.15.4.2 Floor, roof and wall assemblies. The thickness of the SFRM ~~sprayed fire-resistant material~~ applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E605, making not less than four measurements for each 1,000 square feet (93 m^2) of the sprayed area, or portion thereof, in each story.

[BF] 1705.15.4.5 Structural members. The thickness of the SFRM ~~sprayed fire-resistant material~~ applied to structural members shall be determined in accordance with ASTM E605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

[BF] 1705.15.5 Density. The density of the SFRM ~~sprayed fire-resistant material~~ shall be not less than the density specified in the *approved* fire-resistance design. Density of the ~~sprayed fire-resistant material~~ SFRM shall be determined in accordance with ASTM E605. The test samples for determining the density of the ~~sprayed fire-resistant materials~~ SFRM shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) or portion thereof of the sprayed area in each story.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

[BF] 1705.15.6 Bond strength. The cohesive/adhesive bond strength of the cured ~~sprayed fire-resistant material~~ SFRM applied to floor, roof and wall assemblies and structural members shall be not less than 150 pounds per square foot (psf) (7.18 kN/m^2). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E736 by testing in-place samples of the ~~sprayed fire-resistant material~~ SFRM selected in accordance with Sections 1705.15.6.1 through 1705.15.6.3.

[BF] 1705.15.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the SFRM ~~sprayed fire-resistant materials~~ shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) of the sprayed area, or portion thereof, in each *story*.

[BF] 1705.15.6.2 Structural members. The test samples for determining the cohesive/adhesive bond strength of the SFRM ~~sprayed fire-resistant materials~~ shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

[BF] 1705.15.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted where the SFRM ~~sprayed fire-resistant material~~ is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the ~~fire-resistant material~~ SFRM has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

Reason Statement: The purpose of this proposal is to change the definition from Sprayed Fire-Resistant Matertials to Sprayed Fire-Resistive Materials (SFRM). The reason for the change is to align the IBC definition with the industry term for the products. The National Fireproofing Contractors Association's Handbook of Accepted Fireproofing Knowledge (HAFK) uses the term SFRM - Sprayed Fire-Resistive Materials. Secondly, the listing directories refer to "Fire-Resistive" rather than "Fire-Resistant" materials. Several IBC Chapter 7 sections use the term "Fire-Resistive", including fire-resistive glazing and door sections in the Opening Protectives Chapter. Finally, the abbreviations in Chapter 17 follow formatting for other sections (example; Exterior Insulation Finish System (EIFS).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a change in definition, it will not impact the cost of construction.

G29-21

Committee Action: **As Modified**

Committee Modification:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities*.

   1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

   1.3. Roof construction, including girders, trusses, framing and decking.

   Exceptions:

   1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
   2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A *roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

   1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame*

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistive materials and intumescent and mastic <u>fire-resistive</u> ~~fire-resistant~~ coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

722.5.1.3 Sprayed fire-resistive materials.(SFRM). The *fire resistance* of wide-flange structural steel columns protected with SFRM , as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$R = [C_1(W / D) + C_2] h$ **(Equation 7-13)**

where:

R = *Fire resistance* (minutes).

h = Thickness ofSFRM (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The *fire resistance* of structural steel columns protected with intumescent or mastic fire-resistive ~~fire-resistant~~ coatings shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.2.2 Sprayed fire-resistive materials (SFRM). The provisions in this section apply to structural steel beams and girders protected with (SFRM) . Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in *approved* unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the SFRM material is adjusted in accordance with the following expression:

$h_2 = h_1 [W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60]$
(Equation 7-17)
where:

h = Thickness of SFRM in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.
Subscript 1 refers to the beam and SFRM thickness in the *approved* assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of SFRMl.

The *fire resistance* of structural steel beams and girders protected with intumescent or mastic fire-resistive ~~fire-resistant~~ coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

Committee Reason: The committee concluded the modification fixes the main proposal text regarding using "fire-resistive" instead of "fire-resistant". Committee approval is in line with committee action on code change G 17-21. (Vote: 13-0)

G12-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with the floor of an occupied ~~floor~~ story located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Reason: The intent of this proposal is to clarify that an occupied roof that is over 75' where the floor is below 75' does not make this building a high-rise. Also thinking into the future, changing an unoccupied roof to an occupied roof should not change the building requirements to this extent. An open to the air occupied roof does not increase the hazard the same as a story.
If you make this a high-rise what could be added is additional alarm systems requirements, additional requirements for sprinklers, additional special inspections, luminous egress markings in the stairways, a fire command center, standpipes, secondary water supply, smoke detection systems, separation between stairway enclosures, smokeproof enclosures, etc. A justification or need for these systems for just an occupied roof has not been demonstrated.

This would be consistent with the change to Section 503.1.4 –

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided the penthouses and other enclosed roof structures comply with Section 1511.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the story immediately below the roof where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Section 907.5 Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupied roof. Emergency voice/alarm communication system notification per Section 907.5.2.2 shall also be provided in the area of the occupied roof where such system is required elsewhere in the building.

2. (no change to this exception)

A floor is a floor & a roof is a roof. Just because a roof is an "occupied" roof, does not make it a floor. The code has had provisions related to adequate egress from "occupied" roofs for years without classifying the roof as an occupancy for purposes of other code issues including height/area limitations, mixed uses, sprinklers, or type of construction.

The IBC currently requires a minimum of one standpipe hose connection needs to be extended to the roof (Section 905.4 – 2021 IBC).

It should be noted that there are new provisions in the 2015 IBC (Section 903.2.1.6) which addresses sprinkler protection due to an occupied roof and in the 2018 IBC (Section 503.1.4) which address occupied roofs based on the floor immediately below the roof. In both cases, if sprinkler protection is provided throughout the building, whether the roof is an occupied roof has no bearing on height/area limitations, occupancy separation requirements or the classification of the building as a high-rise.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The technical criteria for high-rises would not change. This is a clarification. The opposite interpretation could have a significant increase in building costs because of the additional system indicated in the reason.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because some committee members felt that not including the occupied roof in the definition of high rise ignored the issue of the potential occupant load on the occupied roof. Some of the committee members felt that the safety for persons on the roof was addressed through other sections in the codes. See also the committee reason for G14, G15 and G16. (Vote: 10-4)

Staff Analysis: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G12-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Nugent, representing ICC Building Code Action Committee (bcac@iccsafe.org); Marcin Pazera, representing PIMA (mpazera@pima.org); David Tyree, representing AWC (dtyree@awc.org) requests As Submitted

Commenter's Reason: NUGENT REASON:
This code change, along with G15-21 and G16-21, seeked to clarify an issue that remains unclear even with an ICC interpretation. That is that when using the definition of "HIG-RISE BUILDING," just WHERE is the 75 foot dimension to be measured to? The current definition of a high-rise building is:

HIGH-RISE BUILDING *- A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.*

There is no dissention on where the 75 foot measurement is to start – the lowest level of fire department access, e.g., the lowest point where the fire service can part a vehicle. But where TO STOP measuring the 75 feet appears to be the big question? The definition states that the distance is measured to an "occupiable floor." It seems to come down to - just what is a "floor?" While the term "floor" appears 1,062 time and the term "floors" appears 209 times, there is no definition of "floor" in the IBC.. That is what this code change is attempting to do. To revise the language within the definition to clearly state where the 75 foot dimension is measured to – replacing the ambiguous term "floor" to "story," which is a defined term in the IBC.

In the committee's reason statement for disapproval it states "… some committee members felt that not including the occupied roof in the definition of high rise ignored the issue of the potential occupant load on the occupied roof." We disagree with that statement, as was presented during the testimony for not only this code change but also for G15-21 and G16-21, over the past couple of code development cycles there has been a concerted effort to put in place numerous revisions to the IBC and IFC to address the whole "occupied roof" topic, with the majority geared to life safety, fire protection features and construction materials/methods.

In regard to the issue of building construction the IBC now in Section 503.1.4 states:

503.1.4 Occupied roofs*. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided that the penthouses and other enclosed rooftop structures comply with Section 1511.*

The definition of "high-rise buildings" first appeared in each of the early 1980's and was based on the work done at the 1971 *International Symposium on Fire Safety in High-Rise Buildings* which was sponsored by the General Services Administration (GSA) with participants from not only the US but England, France, Canada and Sweden. They had to arrive at a term that all recognized, thus they used "floor." It was and is a term that is defined around the country in very similar terms.

In the IBC Section 201.4 specifically address terms that are not defined in an I-Code, it states “Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.” In looking at the Merriam-Webster website (https://www.merriam-webster.com/dictionary/floor), the word “floor” is defined as:

Definition of *floor* (Entry 1 of 2)

1 : the level base of a room

2 **a** : the lower inside surface of a hollow structure (such as a cave or bodily part)

b : a ground surface
// the ocean *floor*

3 **a** : a structure dividing a building into stories
also : STORY

b : the occupants of such a floor

4 : the surface of a structure on which one travels
// the *floor* of a bridge

5 **a** : a main level space (as in a stock exchange or legislative chamber) distinguished from a platform or gallery

b : the specially prepared or marked area on which indoor sports events take place

c : the members of an assembly
// took questions from the *floor*

d : the right to address an assembly
// the senator from Utah has the *floor*

6 : a lower limit : BASE

from the floor
: in field goals as opposed to free throws
// made 16 of 18 shots *from the floor*

— see also TAKE THE FLOOR

This code change just seeks to clarify that the term “floor” as used in the definition of high-rise building and in a multitude of other places in the IBC is referring to a horizontal plane that is located WITHIN the walls of a story of a building – not to a structure that is on the roof of a building. We are proposing to replace an undefined term with one that has an IBC definition – Story. Section 202 defines it as:***STORY.*** *That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (see “Basement,” “Building height,” “Grade plane” and “Mezzanine”). A story is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.* We wish to point out that the committee in its acceptance of G15-21 actually confirms that “story” would be the appropriate term for the definition. It is our opinion that through the committee’s action for Approved as Modified, to have there be 2 separate thresholds that in fact they answered the question - the term “floor” is really a horizontal surface located WITHIN an interior space. The term by itself doesn’t include an occupied roof. We do not believe that it was ever the intent that an occupied roof be used as the threshold for the determination of a high-rise building. The hazards associated with occupants within the exterior walls of a building are significantly different than those in spaces that outside of the exterior walls where hot gasses will not be confined.

PAZERA REASON:

Polyisocyanurate Insulation Manufacturers Association (PIMA) is generally supportive of improved fire safety provisions and requirements in the building code. This proposal provides an important clarification to the definition of “high-rise building” in Section 202 of the International Building Code (IBC). This change to “floor of an occupied story” provides a clear distinction between occupied floor and occupied roof. In the current definition (2021 IBC) it could be inferred that occupied roofs (located above an occupied space) could trigger reclassification of a building to a high-rise building, and thus trigger unnecessary or unwarranted upgrades. In our opinion, occupied roofs (open to the outdoor environment) do not carry the same fire safety risks as occupied spaces. This proposal aims to clarify this concept while maintaining current building code requirements. The opponents of this proposal argued that increased fire safety is necessary, however, they have failed to provide substantiating evidence to support such a request. PIMA requests approval as submitted of proposal number G12-21.

TYREE REASON:

This proposal by the BCAC is the correct way to best clarify the definition of HIGH-RISE BUILDING without creating such a distinctly different and contrary intent created by the definition change as was approved by G15. Disapproval of G15-21 is also recommended.

The modification spelled out in this proposal aligns with the language provided for in IBC Section 503.1.4 which states:**503.1.4 Occupied roofs.** A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided that the penthouses and other enclosed rooftop structures comply with Section 1511.By changing the definition of HIGH-RISE BUILDING as approved by G15-21 the intent that occupying roofs should not trigger code provisions attributed to building height or number of stories has been circumvented. The change to the definition will now put into place requirements for sprinkler protection that were already covered by exception 1 from Section 503.1.4, as well as triggering the 8 Emergency Systems (Smoke detection, Fire alarm system, Standpipe system, Emergency voice/alarm communication system, Emergency communication coverage, Fire command center, Smoke removal, and Standby and emergency power) required by Section 403.4 without providing any justification that those systems are needed simply because one is adding as few as a couple of occupants to an area of the roof.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The technical criteria for high-rises would not change. This is a clarification. The opposite interpretation could have a significant increase in building costs because of the additional system indicated in the reason.

Public Comment# 2643

G14-21

IBC: SECTION 202

Proponents: Eric R Bressman, Ankrom Moisan Architects, representing Ankrom Moisan Architects (ericb@ankrommoisan.com); Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied floor or roof located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Bressman:
With the introduction of the new occupied roof regulations in the 2018 IBC, this definition needs to clarify that when an occupied roof is included as part of a building design, this must be taken into account when determining if the building meets the definition of a high-rise building. This is not a technical change to the requirement, but clarifies it.

McHugh:

The purpose of this code proposal is to clarify that the roof is to be included in the definition of a high rise building. With more and more buildings using the rooftop as occupiable space during winter, spring, summer and fall, this is needed in the definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Bressman: This change does not materially change the Code, but is only a clarification.

McHugh: The code change proposal will increase the cost of construction

The answer to the question of whether this proposal increases the cost of construction is that if the roof is used as an occupiable space, it does not add to the cost of construction because it is another story and should have been included in the first place. Because of changes in the 2021 IBC, this will mean that if the building owner chooses to make the roof occupiable, it means that it will be part of the building. The building owner will have to factor the roof into the leasable area of the structure, and spread costs across the rent as an amenity or include it in marketing advantages over other buildings.

G14-21

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved because the modification would require the measurement for determining if a building was a high rise by measuring to all roofs - occupied or not. See also the Committee Action to G12, G15 and G16. (Vote: 14-0)

Staff Analysis: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G15-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied floor or occupied roof located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Reason: The existing language refers to a floor that is more than 75 feet above the lowest level of fire department vehicle access. It is our opinion that an occupied roof is also a floor. A floor is something you walk on and people walk on an occupied floor. Therefore, we are proposing to provide clarifying language to include occupied roofs above 75 feet to classify the building as a high-rise building. The presence of occupants and combustible furnishings add to the difficulty of performing ground-based fire fighting. It also limits the ability of the firefighters to perform rescue operations from the ground. By classifying an occupied roof over 57 feet, additional safety provisions are required in the building.
This proposal will have an impact on the application of the Existing Building Code. If someone wants to convert an existing roof to an occupied roof and the roof is more than 75 feet above the lowest level of fire department vehicle access, the building will need to be upgraded to comply with the high rise building provisions in IBC Section 403. The addition of floor area would make the building less code complying that it was prior to constructing the occupied roof.

Cost Impact: The code change proposal will increase the cost of construction
If a jurisdiction did not previously classify an occupied roof as a floor, the increased safety requirements for high-rise buildings will increase the cost of construction. However, if they are already looking at the occupied roof as an occupied floor, the cost of construction would not increase.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G15-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal to add 'occupied roofs' to the definition of 'highrise' was approved due to the concern that occupants on the occupied roof need to be protected with elements other than just being open to the outside air. Fire department access to the roof is important for life safety. Concerns were raised that protection for occupied roofs were already addressed in other portions of the code, so having an occupied roof above the 75 foot height should not add the entire 'highrise' package of requirements - especially if the occupied roof was only a small portion of the overall roof. The proposal did not address the issue if a 'floor' is the floor of the story below the roof, a mezzanine in the top story, or what would be required for an occupied roof with elevated platforms on portions of the occupied roof. There was also a concern about the impact on existing building that wanted to add amenities on the roof. See also the Committee Action to G12, G14 and G16. (Vote: 10-4)

Staff Analysis: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G15-21

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee

(lkranz@bellevuewa.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[BG] HIGH-RISE BUILDING . A building ~~with an occupied floor or occupied roof~~ where either of the following are located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access:1. An occupied floor.2. An occupied roof with an occupant load of 50 or more.

Commenter's Reason: G15-21 is intended to clarify whether an occupied roof can be considered an occupied floor for the purposes of triggering high rise provisions in Section 403. However, as written, **any** occupied roof located above the 75-foot threshold, regardless of size or occupant load, will trigger those requirements.
This public comment would provide the option to have smaller occupied roofs on tall buildings without the need to comply with high-rise regulations in Section 403by establishing an occupant load of 50 or more people on the occupied roof before a building would become a high rise.

At the Committee Action Hearings, several testifiers spoke in favor of G16-21, which would have established an occupant load trigger of 50. There was also testimony at the hearings that suggested an occupant load of 100 should be allowed. In our judgment, 50 occupants (which equates to a 750 square foot roof deck) is a good compromise between 1 occupant (too few) and 100 occupants (too many). A trigger of 50 occupants also corresponds to the threshold for determining assembly occupancies (Section 303.1.2, Item 1). We feel that once an assembly occupancy is on the occupied roof, that is a large enough number of people to justify treating the occupied roof the same as an occupied floor.

Occupants on smaller occupied roofs are at lower risk than those on the floor below because smoke will not accumulate on an occupied roof as it does inside of the building. Mid-rise buildings that are close to meeting the definition of a high rise building, will have the same level of notification and sprinkler protection (see Section 503.1.4, exception 1) as those inside the building and will only have 1 additional level of stairs to traverse than those on the floor below.

An example of where smaller occupied roofs could trigger high rise compliance is on a 7 story multi-family building with 6 units per floor. The elevation of the occupied roof slightly exceeds 75 feet to the lowest fire truck access. In this case, the occupants on the highest level of the building have access to 400 Sq. Ft. occupied roofs accessible only by the tenants of each dwelling unit. Each occupied roof will have an occupant load of 2 (400 Sq. Ft. divided by a 200 Sq. Ft. OLF) X 6 = 12 people. As approved, this building would have to comply with the high-rise provisions. If this public comment is approved, it would not be considered to be a high rise, because the total occupant load is less than 50. The building would still be protected by approved sprinkler and a fire alarm systems.

This public comment does not compromise the safety of building occupants and establishes a reasonable threshold for when to apply high rise provisions for occupied roofs.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The current definition of High-Rise Building is measured from the lowest level of fire department vehicle access to the highest occupied floor. If approved, this code change will define some buildings with an occupied roof as High-Rise which under the current definition, would be considered to be mid-rise. High-Rise buildings are more expensive to build because of the added life safety systems required in Section 403.

If this is approved as modified, it will cause more buildings to have to comply with high-rise provisions which will in fact increase the cost of construction.

Public Comment# 2377

Public Comment 2:

Proponents: Mike Nugent, representing ICC Building Code Action Committee (bcac@iccsafe.org); Marcin Pazera, representing PIMA (mpazera@pima.org); David Tyree, representing AWC (dtyree@awc.org) requests Disapprove

Commenter's Reason: NUGENT:
This proposal seeks to dramatically change the threshold for when a building would become classified as a “high-rise.” The current definition of a high-rise building has a single threshold - A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

This proposal seeks to change the definition to have 2 thresholds – buildings with:

- an occupied floor located more than 75 feet above the lowest level of fire department vehicle access.

· an occupied roof located more than 75 feet above the lowest level of fire department vehicle access.

We do wish to address the comments made by the proponents made during the public testimony. As reflected in the testimony and in the 2021 REPORT OF THE COMMITTEE ACTION HEARINGS, they stated this change was needed for the following reasons:

1. There are mixed interpretations on how to apply the definition as currently written – the biggest question is what constitutes an "occupied floor?"

It is our opinion that through the committee's action for Approved as Modified (10-4), the committee in fact answered that question by an overwhelming margin by expanding the definition of "high-rise building" to have 2 separate thresholds. To retain the term "occupied floor" and add "occupied roof" the committee made it clear that an "occupied floor" is going to be a horizontal element that is WITHIN the exterior walls of a building (aka – floor surface within a story), and that an "occupied roof" is going to be a horizontal element that is on top of the roof of a building.

Through their action, the committee essentially supports what is being proposed in Code Change G12-21 being put forth by the BCAC in which "floor" is proposed to be replaced by "story."

2. Concern that occupants on the occupied roof need to be protected with elements other than just being open to the outside air.

The logic appears to be that IF a building with an occupied roof is put into the high-rise category that the building will be provided with some heighten level of "protection" (aka – fire rated construction). But without a lot of other changes to the code – that is not true.

Take a fully sprinklered building with an occupied roof where the "height" of the building is 75 feet (measured from grade plane to the ROOF) – but where the distance from the lowest level of fire department access to the occupied roof is 78 ft. Yes the building would be a high-rise BUT given the building complies with the area limits, for many occupancies IBC Table 504.3 would allow the building to be of an unprotected construction - Type IIIB or IIB construction – which means there would no fire ratings on the structural elements per Table 601. And note that this allowable height even applies to buildings with Group A occupancies.

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			
		A	B	A	B	A	B	A	B	C	HT
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	65	65	65
	S	UL	180	85	75	85	75	270	180	85	85
H-1, H-2, H-3, H-5	NS[c, d]	UL	160	65	55	65	55	120	90	65	65
	S										
H-4	NS[c, d]	UL	160	65	55	65	55	65	65	65	65
	S	UL	180	85	75	85	75	140	100	85	85
I-1 Condition 1, I-3	NS[d, e]	UL	160	65	55	65	55	65	65	65	65
	S	UL	180	85	75	85	75	180	120	85	85
I-1 Condition 2, I-2	NS[d, e, f]	UL	160	65	55	65	55	65	65	65	65
	S	UL	180	85							
I-4	NS[d, g]	UL	160	65	55	65	55	65	65	65	65
	S	UL	180	85	75	85	75	180	120	85	85
R[h]	NS[d]	UL	160	65	55	65	55	65	65	65	65
	S13D	60	60	60	60	60	60	60	60	60	60
	S13R	60	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	270	180	85	85

IS THIS BUILDING REALLY MORE PROTECTED???

No one will take the reduction for Type of Construction fire ratings allowed in 403.2.1 because there are no fire ratings to reduce. Because of this, sprinkler control valves won't be equipped with supervisory initiating devices or water-flow initiating devices.

The threshold for an occupied floor being 75' above fire department access fundamentally put in place a back-stop for buildings that had a "height" of more than 75 feet, which typically saw a high-rise building being of a "protected" type of construction. But if this code change is successful that will not be the case.

1.

Fire department access to the roof is important for life safety.

The logic associated with this comment appears to be that IF a building with an occupied roof is put into the high-rise category, there will then be improved fire department access that is not provided in a non-high-rise building. But that is not true. Just by putting a building with an occupied roof into the high-rise category, increased fire department access to the roof will not automatically improve. Other provisions of the code currently dictate that there must be exits from the roof, the number of exits, and the size/capacity of exits – all of which are used by the fire service for access. There is a general thinking that IF you have a high-rise building there will be fire service access elevators - but that is not true. Fire service access elevators are ONLY required when "… the occupied floor is more than 120 feet above the occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access." So, a building having an occupied roof located 76 feet above the lowest level of fire department vehicle access will be a high-rise building but will not be required to have fire service access elevators.

In addition, we want to emphasize the comments that were made/raised by opponents to this code change during the code action hearing – these included:

· The fact that over the past couple of code development there has been a concerted effort to put in place numerous revisions made to the IBC and IFC to address the whole "occupied roof" topic, including many geared to life safety, fire protection features and construction materials/methods. And in fact, this proposal is contrary to the intent of the language provided for in the current IBC in Section 503.1.4 (to which there were no code changes) which states:

***503.1.4 Occupied roofs**. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided that the penthouses and other enclosed rooftop structures comply with Section 1511.*

· NO statistics or technical data was provided to show that the current regulations do not already adequately address the hazards that an occupied roof presents when placed on a building that is not a high-rise building.

· NO WHERE in the proponent's reason statement nor in testimony was there a real discussion of the cost impact this will have if successful – new or/and existing construction. Just how much more will it cost to build a building that has an occupied roof (@75ft Above Fire Department Vehicle Access) as a high-rise than one that is not a high-rise? I think we all know that it would be significant. When asked specifically about the impact on existing building the commentors indicated that the issue can be addressed through revisions to the IEBC in Group B. BUT no one has presented the beginnings of what this would look like. Without fully understanding how this change will affect both new and existing building and the costs involved, moving forward with a stand-alone change for only new buildings totally ignores the full impact this change could have.

· The proposed code change treats a very small area of occupied roof the same as a very large, occupied roof, nor does it provide any differentiation based on how that occupied roof is being used. What if a 1,000sf occupied roof were constructed on a building that has roof with an area of 30,000 sf? Does the placement of a space that is 10% of the roof area warrant the pushing the whole building into a high-rise category? This logic totally flies in the face of the mixed occupancy philosophy in IBC Section 508 where a space that is 10% or less of the floor area is NOT considered a separate occupancy for applying the code provisions.

· And how about the question – just exactly WHERE do you measure the 75 foot dimension to? Is this now to the top of the "roof" or the top of the floor system that sits on top of the roof? What if there are multiple occupied roofs on a single roof – all at different elevations?

· And please note that in this code development cycle there is a code change (S10-21) - which was Approved as Modified (12-1) – that introduced some much-needed regulations on the constructability of occupied roof. It included restrictions on the types of materials that can be used for the construction of occupied roofs, and restrictions on the voids that are created between the roof and the occupied roof.

The committee erred by recommending As Submitted when the proponent provided no justification for triggering so many additional systems when only a single person may be occupying a roof. There are real costs that should have been more closely scrutinized considering the proponent did not speak to the significant costs associated with providing the additional emergency systems.

In summary, by changing the definition of HIGH-RISE BUILDING, as approved in this proposal, the intent that occupying roofs should not trigger code provisions attributed to building height or number of stories has been circumvented. The change to the definition by G15-21 will now put into place requirements for sprinkler protection that were already covered by exception 1 from Section 503.1.4, as well as triggering the following emergency systems: smoke detection, fire alarm system, standpipe system, emergency voice/alarm communication system, emergency communication coverage, fire command center, smoke removal, and standby and emergency power required by Section 403.4. These additional features will be triggered by providing an occupied roof that is designed for an occupant load as low as a single person. Instead of changing the definition, the proponent should have identified and substantiated the specific provisions that were lacking and then proposed those specific changes within IBC Section 503.1.4.

PAZERA:

This proposal adds “occupied roofs” to the definition for “high-rise building”, and thus unnecessarily expands the code requirements applicable to occupied roofs of all types and uses. Polyisocyanurate Insulation Manufacturers Association (PIMA) has number of concerns regarding the impacts this proposal will have on new but more importantly on existing buildings since this proposal significantly increases fire safety requirements for occupied roofs. The proposal impacts existing buildings and will likely require upgrades to comply with high-rise building provisions when the existing building is reclassified as a high-rise. This provision will be highly disruptive to building owners who will be burdened with extensive renovations in order to comply with high-rise building provisions. Fire safety concerns and fire safety risks for occupied roofs (open to the outdoor environment) are not equivalent to those in the occupied space (enclosed space). Enclosed spaces pose a more significant fire risk. Fire safety concerns for occupied roofs should be addressed through specific proposals that established requirements that are proportional to the fire safety risk. Treating any occupied roof as an occupied space ignores important differences in interior and exterior building locations and conditions. PIMA requests disapproval of proposal number G15-21.

TYREE:

This proposal is contrary to the intent of the language provided for in IBC Section 503.1.4 which states:

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided that the penthouses and other enclosed rooftop structures comply with Section 1511.

By changing the definition of HIGH-RISE BUILDING as approved in this proposal, the intent that occupying roofs should not trigger code provisions attributed to building height or number of stories has been circumvented. The change to the definition by G15-21 will now put into place requirements for sprinkler protection that were already covered by exception 1 from Section 503.1.4, as well as triggering the following emergency systems: smoke detection, fire alarm system, standpipe system, emergency voice/alarm communication system, emergency communication coverage, fire command center, smoke removal, and standby and emergency power) required by Section 403.4. These additional features will be triggered for a building designed to provide an occupied roof area to be used by just a single person. This interpretation will also throw many other questions into the mix. How do you classify the occupancy of occupied roof decks? Does the roof deck contribute to the building area? Does the height and area table (IBC Table 503) apply to the outdoor area? This is just the beginning.

If ever a evacuation of a high-rise roof built to modern codes has been hampered by the occupants or other fixtures on the roof, please identify those cases. The committee erred by recommending As Submitted when the proponent provided no justification for triggering so many additional systems when only a single person may be occupying a roof. There are real costs that should have been more closely scrutinized considering the proponent did not identify the significant costs associated with providing the additional systems.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original proposal AS could have a significant increase in building costs because of the additional system indicated in the reason.

The disapproval of the original proposal as requested in this public comment will result in that the technical criteria for high-rises would not change.

Public Comment# 2669

G16-21

Proposed Change as Submitted

Proponents: Lee Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

[BG] HIGH-RISE BUILDING. A building with an occupied roof having an occupant load of 50 or more, or an occupied floor, located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Reason: In an October, 2019 article titled 'Through the roof: Occupied roofs in the 2018 IBC', Kim Paarlberg writes that "What has not been clarified is if an occupied roof is considered an occupied floor when determining does or does not have to meet the high-rise provisions in the code (definition of "high-rise building" and Section 403)". This code change is intended to address this lack of clarity.
High-rise buildings utilizing the new regulations in the 2021 IBC for occupied roofs are gaining in popularity with building owners and designers. In the current definition of *High-rise building*, we measure from the lowest level of fire department vehicle access to the highest 'occupied floor' and if located more than 75 feet above this point then it is considered a *high-rise building*. What is not clear is if an occupied roof is considered the same as an occupied floor. This code change corrects this ambiguity by adding an occupied roof with an occupant load of 50 or more to the definition. The proposal includes a threshold of 50 people before the occupied roof is applicable to the definition because it was felt that less than 50 is not considered to be assembly and with less than 50 people, it would be manageable in terms of meeting a timed egress analysis to get the occupants to a safe location.

The standard for determining if a building should be provided with all the additional safety measures required for a high-rise building has historically been based on the location of the highest occupied floor. This is due to the limitations of most fire department ladder trucks to reach occupants on the upper portions of the building. Occupied roofs are not considered to be a 'Story' for determining the maximum height of a building but regardless, these areas are occupied and would not be within the reach limitations of a fire department ladder truck if located more than 75 feet above the lowest level of fire department vehicle access. Based on this concept, occupied roofs should be considered the same as any other occupied floor of a building.

Cost Impact: The code change proposal will increase the cost of construction
The current definition of High-Rise Building is measured from the lowest level of fire department vehicle access to the highest occupied floor. If approved, this code change will define some buildings with an occupied roof as High-Rise which under the current definition, would be considered to be mid-rise. High-Rise buildings are more expensive to build because of the added life safety systems required in Section 403.

Staff note: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G16-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as it could be read to apply to occupied roofs on any height building. There was also the question if someone could post an occupant load to limit the occupant load on the roof or if this needed to be the calculated occupant load. Concerns were raised that protection for occupied roofs were already addressed in other portions of the code, so having an occupied roof above the 75 foot height should not add the entire 'highrise' package of requirements - especially if the occupied roof was only a small portion of the overall roof. The proposal did not address the issue if a 'floor' is the floor of the story below the roof, a mezzanine in the top story, or what would be required for an occupied roof with elevated platforms on portions of the occupied roof. There was also a concern about the impact on existing building that wanted to add amenities on the roof. See also the Committee Action to G12, G14 and G15. (Vote: 9-4)

Staff Analysis: G12-21, G14-21, G15-21, G16-21 addresses requirements in a different or contradicting manner. G14-21, G15-21 and G16-21 addresses similar requirements in a different manner to those found in current IBC Section 503.1.4. The committee is urged to make their intentions clear with their actions on these proposals.

G16-21

Individual Consideration Agenda

Public Comment 1:

Proponents: David Tyree, representing AWC (dtyree@awc.org) requests As Submitted

Commenter's Reason: We are urging approval as submitted as proposed by WABO. G16-21 represents a common sense approach to handing issues related to occupants using the roof for other purposes and is the stated intent in Section 503.1.4. This proposal only goes further to clarify the intent of the language specified in IBC Section 503.1.4 which states:
503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided that the penthouses and other enclosed rooftop structures comply with Section 1511.

By establishing an occupant load threshold of 50 occupants as specified in this proposal, it will clarify any misconceptions that this section would allow unsafe conditions to occur and specify a very limited number of occupants on the roof and providing the necessary fire safety requirements to safely protect those occupants.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Establishing a low threshold of occupants on the roof does not increase or decrease any costs associated with this clarification.

Public Comment# 2317

G20-21 Part I

Proposed Change as Submitted

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

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

2021 International Building Code

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Revise as follows:

[BG] PENTHOUSE. An enclosed, unoccupiable ~~unoccupied~~ rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, *stairways,* and vertical *shaft* openings.

302.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508 . Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupiable ~~Occupied~~ roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4 .

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

503.1.4 Occupiable~~Occupied~~ roofs. A roof level or portion thereof shall be permitted to be used as an occupiable ~~occupied~~ roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupiable ~~occupied~~ roofs shall not be included in the *building area* as regulated by Section 506. An occupiable ~~occupied~~ roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupiable ~~occupied~~ roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinker system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupiable ~~occupied~~ roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided in the area of the occupiable ~~occupied~~ roof where such system is required elsewhere in the building.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

503.1.4.1 Enclosures over occupiable ~~occupied~~ roof areas. Elements or structures enclosing the occupiable ~~occupied~~ roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupiable ~~occupied~~ roof.

Exception: *Penthouses* constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.

1004.7 Outdoor areas. *Yards*, patios, occupiable ~~occupied~~ roofs, *courts* and similar outdoor areas accessible to and usable by the building occupants shall be provided with *means of egress* as required by this chapter. The *occupant load* of such outdoor areas shall be assigned by the *building official* in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the path of egress travel from the outdoor areas passes through the building, *means of egress* requirements for the building shall be based on the sum of the *occupant loads* of the building plus the outdoor areas.

Exceptions:

1. Outdoor areas used exclusively for service of the building need only have one *means of egress*.
2. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

1006.1 General. The number of *exits* or *exit access doorways* required within the *means of egress* system shall comply with the provisions of Section 1006.2 for spaces, including *mezzanines*, and Section 1006.3 for *stories* or occupiable ~~occupied~~ roofs.

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

1006.3.1 Occupant load. Where *stairways* serve more than one *story*, or more than one *story* and an occupiable ~~occupied~~ roof, only the *occupant load* of each *story* or occupiable ~~occupied~~ roof, considered individually, shall be used when calculating the required number of *exits* or access to *exits* serving that *story*.

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

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

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

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

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

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

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

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

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

Exceptions:

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

1011.12 Stairway to roof. In buildings four or more stories above grade plane, one *stairway* shall extend to the roof surface unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope).

Exception: Other than where required by Section 1011.12.1, in buildings without an occupiable ~~occupied~~ roof access to the roof from the top *story* shall be permitted to be by an *alternating tread device*, a ships ladder or a permanent ladder.

1011.12.2 Roof access. Where a *stairway* is provided to a roof, access to the roof shall be provided through a *penthouse* complying with Section 1511.2.

Exception: In buildings without an occupiable ~~occupied~~ roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m^2) in area and having a minimum dimension of 2 feet (610 mm).

1011.14 Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in buildings of Groups F, H and S from a *mezzanine* not more than 250 square feet (23 m^2) in area and that serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area and for access to unoccupiable ~~unoccupied~~ roofs. *Alternating tread devices* used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

1011.15 Ship's ladders. Ship's ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupiable ~~unoccupied~~ roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ship's ladders shall be designed for the live loads indicated in Section 1607.17.

1011.16 Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code and designed for the live loads indicated in Section 1607.17. Permanent ladders shall be permitted to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.
5. Nonoccupiable ~~Nonoccupied~~ roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.
6. Where permitted to access equipment and appliances in accordance with Section 306.5 of the International Mechanical Code.

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

Exceptions:

1. *Exit access stairways* and *ramps* that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section

903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.

5. *Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.
6. *Exit access stairways* and *ramps* in *open parking garages* that serve only the parking garage.
7. *Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
9. Exterior *exit access stairways* or *ramps* between occupiable ~~occupied~~ roofs.

1104.4 Multistory buildings and facilities. At least one *accessible* route shall connect each accessible *story, mezzanine* and occupiable ~~occupied~~ roofs in multilevel buildings and *facilities*.

Exceptions:

1. An *accessible* route is not required to *stories, mezzanines* and occupiable ~~occupied~~ roofs that have an aggregate area of not more than 3,000 square feet (278.7 m^2) and are located above and below accessible levels. This exception shall not apply to:
   1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces used for the sales or rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels.
   1.2. *Stories* or *mezzanines* containing offices of health care providers (Group B or I).
   1.3. Passenger transportation facilities and airports (Group A-3 or B).
   1.4. Government buildings.
   1.5. Structures with four or more dwelling units.
2. *Stories*, *mezzanines* or occupiable ~~occupied~~ roofs that do not contain accessible elements or other spaces as determined by Section 1108 or 1109 are not required to be served by an accessible route from an *accessible* level.
3. In air traffic control towers, an *accessible route* is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one *story* or *mezzanine* with an *occupant load* of five or fewer persons that does not contain *public use* space, that *story* or *mezzanine* shall not be required to be connected by an *accessible route* to the *story* above or below.

Reason: Over the last several cycles, code provisions have been added to address issues related to occupied/occupiable, vegetative and landscaped roofs. In some cases, the terms have been used interchangeably, in others applying to specific types of roof systems. With the increasing number of provisions, a definition is needed. A proposal last cycle (G7-19) attempted to add a definition for occupiable roof but was disapproved for several reasons including the fact it did not correlate with the fact the code uses “occupied roof” in some sections and “occupiable roof” in others.
This code proposal both adds a definition for “occupiable roof”and. changes terminology throughout the code to be consistent with use of “occupiable roof” rather than “occupied roof”. The definition is intended to parallel the existing code definition for occupiable space:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

The proposed definition is different in a few key ways: The laundry list of uses is left out, and the one clarification made that access for maintenance of rooftop mechanical equipment or other maintenance does not trigger assembly live load requirements or other provisions related to occupiable roofs. The references to light and ventilation are left out as occupiable roofs are exterior spaces. No mechanical ventilation is necessary, and the code does not require lighting for exterior spaces other than portions of the means of egress.

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

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

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard

to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change is purely editorial and does not affect how occupiable roofs are designed or constructed.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance or repair, and which is equipped with a means of egress system meeting the requirements of this code.

Committee Reason: The modification added 'repair' to the definition, which is consistent with other sections in the codes related to roof requirements. The definition was approved because it clarifies a 'occupiable roof' is for roofs for human occupancy on a regular basis. The term was also coordinated throughout the code. (Vote: 12-2)

Staff Analysis: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202

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

Modify as follows:

2021 International Building Code

OCCUPIABLE ROOF . An ~~exterior~~ uncovered space on a roof that is designed for human occupancy, other than maintenance or repair, and which is equipped with a means of egress system meeting the requirements of this code.

Commenter's Reason: This public comment is intended to address an ambiguity that is introduced by the proposed definition for occupiable roofs by clarifying that the main feature of an occupiable roof is that it is uncovered--no roof overhead. The same public comment is being submitted for Part II.
As proposed, "exterior" is very open to interpretation, which will lead to inconsistent application. For example, if an occupiable roof has some sort of roof or roof-like structure completely covering it but there are no walls, is that space "exterior?" Does it include areas under a pergola, a gazebo, or a patio cover? Does being inside or under these structures mean that you are still "exterior" to the roof? The City of Seattle has seen projects where the architect argued a "shade structure" is not a roof, and therefore, is allowed to cover the roof deck entirely and not create an additional story. This certainly violates the intent, if not the letter, of what an occupiable roof is supposed to be.

For this public comment, "uncovered" was chosen to replace "exterior" because that is the term used in the definition of "court" in Chapter 2. Essentially, a court is supposed to be open to the sky. When proposals to change the provisions for occupiable roofs are discussed, much of the discussion is about how open the space is, and how smoke does not accumulate. This seems to indicate the image people have of an occupiable roof is that it, like a court, is open to the sky.

The question then, is what about building elements or structures (guards, parapets, rooftop structures, wind screens, fences, etc.)--can they be placed around an occupiable roof? Our answer would be, yes, as long as they comply with the maximum height criteria in Section 503.1.4.1. These elements will not impede the flow of smoke upward and away from the occupiable roof.

A contributing factor to confusion is the current title of Section 503.1.4.1, "Enclosures **over** occupied roofs" [emphasis ours]. This again implies that a roof or roof-like structure can be placed above an occupiable roof. When the requirements for occupied roofs were first introduced into the code, two of the members of WABO's Technical Code Development Committee were involved in the discussions/negotiations. Our recollection is Section 503.1.4.1 was clearly intended to refer to vertical elements (walls or parapets) surrounding the occupied roofs, not roofs above the occupied roof, since the 48-inch height restriction was added to provide firefighters an escape route off the roof. Recognizing that section titles are editorial and determined by ICC Staff, we would recommend that Staff change the title to "Enclosure of occupiable roofs" or "Enclosures around occupiable roofs," to avoid confusion. No changes to the text of the section are necessary.

We believe this public comment provides an important clarification of the definition, and will lead to more consistent application of the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original cost impact statement indicated the change is editorial, and therefore, there is no change in the cost of construction. This public comment is a clarification of the original proposal, and does not change the cost impact.

Public Comment# 2445

G20-21 Part II

Proposed Change as Submitted

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

2021 International Fire Code

Add new definition as follows:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance, and which is equipped with a means of egress system meeting the requirements of this code.

Revise as follows:

903.2.1.6 Assembly occupancies on roofs. Where an ~~occupied~~ occupiable roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the ~~occupied~~ occupiable roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

Reason: Over the last several cycles, code provisions have been added to address issues related to occupied/occupiable, vegetative and landscaped roofs. In some cases, the terms have been used interchangeably, in others applying to specific types of roof systems. With the increasing number of provisions, a definition is needed. A proposal last cycle (G7-19) attempted to add a definition for occupiable roof but was disapproved for several reasons including the fact it did not correlate with the fact the code uses “occupied roof” in some sections and “occupiable roof” in others.
This code proposal both adds a definition for “occupiable roof”and. changes terminology throughout the code to be consistent with use of “occupiable roof” rather than “occupied roof”. The definition is intended to parallel the existing code definition for occupiable space:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

The proposed definition is different in a few key ways: The laundry list of uses is left out, and the one clarification made that access for maintenance of rooftop mechanical equipment or other maintenance does not trigger assembly live load requirements or other provisions related to occupiable roofs. The references to light and ventilation are left out as occupiable roofs are exterior spaces. No mechanical ventilation is necessary, and the code does not require lighting for exterior spaces other than portions of the means of egress.

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

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

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change is purely editorial and does not affect how occupiable roofs are designed or constructed.

Staff Note: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance or repair, and which is equipped with a means of egress system meeting the requirements of this code.

Committee Reason: The committee stated that the reason for the approval of the modification was that the inclusion of the term repairs is important to the language of the definition. The reason for the approval of the proposal is that it provides a definition for a needed clarification of an occupiable roof. (Vote: 11-0)

Staff Analysis: G20-21, G21-21 and G22-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

G20-21 Part II

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION 202

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

Modify as follows:

2021 International Fire Code

OCCUPIABLE ROOF . An ~~exterior~~ uncovered space on a roof that is designed for human occupancy, other than maintenance or repair, and which is equipped with a means of egress system meeting the requirements of this code.

Commenter's Reason: This public comment is intended to address an ambiguity that is introduced by the proposed definition for occupiable roofs by clarifying that the main feature of an occupiable roof is that it is uncovered--no roof overhead. The same public comment is being submitted for Part I.
As proposed, "exterior" is very open to interpretation, which will lead to inconsistent application. For example, if an occupiable roof has some sort of roof or roof-like structure completely covering it but there are no walls, is that space "exterior?" Does it include areas under a pergola, a gazebo, or a patio cover? Does being inside or under these structures mean that you are still "exterior" to the roof? The City of Seattle has seen projects where the architect argued a "shade structure" is not a roof, and therefore, is allowed to cover the roof deck entirely and not create an additional story. This certainly violates the intent, if not the letter, of what an occupiable roof is supposed to be.

For this public comment, "uncovered" was chosen to replace "exterior" because that is the term used in the definition of "court" in Chapter 2. Essentially, a court is supposed to be open to the sky. When proposals to change the provisions for occupiable roofs are discussed, much of the discussion is about how open the space is, and how smoke does not accumulate. This seems to indicate the image people have of an occupiable roof is that it, like a court, is open to the sky.

The question then, is what about building elements or structures (guards, parapets, rooftop structures, wind screens, fences, etc.)--can they be placed around an occupiable roof? Our answer would be, yes, as long as they comply with the maximum height criteria in Section 503.1.4.1. These elements will not impede the flow of smoke upward and away from the occupiable roof. We would note that the current title of Section 503.1.4.1 is "Enclosures over occupied roofs," which introduces confusion as to what is intended. In our reason statement for Part I, we have suggested ICC Staff change the title to "Enclosure of occupiable roofs" or "Enclosures around occupiable roofs."

We believe this public comment provides an important clarification of the definition, and will lead to more consistent application of the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original cost impact statement indicated the change is editorial, and therefore, there is no change in the cost of construction. This public comment is a clarification of the original proposal, and does not change the cost impact.

Public Comment# 2449

G13-21

IBC: 503.1.4

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the *story* immediately below the roof. The area of the occupied roofs shall not be included in the *building area* as regulated by Section 506. An occupied roof shall not be included in the *building height* or number of *stories* as regulated by Section 504, provided that the *penthouses* and other enclosed *rooftop structures* comply with Section 1511.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided ~~in the area of~~ throughout the ~~occupied~~ roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided throughout ~~in the area of~~ the ~~occupied~~ roof where such system is required elsewhere in the building.
2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

Reason Statement: The purpose of this code proposal is to bring what really happens in the world after the certificate of occupancy is issued to the code that regulates occupied or occupiable roofs. Will the size of the occupiable roof space expand and change after certificate of occupancy is issued? What about those that might wander on an outside the emergency voice/alarm communication system area? This proposal brings coverage for the alarm system and also includes the area as another story. The reason why this is needed is to tie the definition of occupiable space to technical requirements in Chapter 5. When a rooftop is occupied for a small number of people, its safety features need to be the same as if they were on the floor below - an assumed larger number of people. At new construction, we do not know how many people will be on that rooftop at any given time, hence the requirements.

Cost Impact: The code change proposal will increase the cost of construction
However, alarm sound coverage needs to occur where people might be if on an occupied roof. What if they want privacy for a phone call and wander out of range with a headset on? Or, what if they go to relax privately in an area other than the 'occupied roof area'? While it increases costs, it also reflects what might occur in the real world.

G13-21

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as too broad of a requirement. By asking for occupant notification throughout the roof, this would include unoccupied portions and areas accessed only by maintenance and service personnel that would only be on the roof for very limited times. This is not feasible for all roof areas. A problem with people wandering off or portions of occupied roofs has not been demonstrated - this could be addressed by barriers. (Vote: 14-0).

G135-21

Proposed Change as Submitted

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601 FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[~~f~~ g] (see Section 202)	3[a, ~~b~~ c]	2[a, ~~b,~~ c, d]	1[~~b,~~ c, d]	0[e d]	1[~~b,~~ c, d]	0	3[a]	2[a]	2[a]	HT	1[~~b,~~ c, d]	0
Bearing walls												
Exterior[~~e, f~~, g]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT[~~g~~ h]	1	0
Nonbearing walls and partitions Exterior	See Table 705.5											
Nonbearing walls and partitions Interior[~~d~~ e]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[~~b,~~ c]	1[b,c, d]	1[b,c, d]	0[e d]	1[b,c,d]	0	$1\frac{1}{2}$[b]	1[b]	1[b]	HT	1[b,c,d]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Where a roof is an occupiable space, the fire-resistance rating of the roof assembly shall be equal to or greater than the floor below.

~~b.~~ c. Except in Group F-1, H, M and S-1 occupancies and where the roof is an occupiable space, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

~~c.~~ d. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

~~d.~~ e. Not less than the fire-resistance rating required by other sections of this code.

~~e.~~ f. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

~~f.~~ g. Not less than the fire-resistance rating as referenced in Section 704.10.

~~g.~~ h. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason: The purpose of this code proposal is to bring clear guidance to code users that the complete roof assembly is to be fire-resistance rated and not just the area under the occupiable space. This code proposal recognizes that the size of the occupied area can change after certificate of occupancy is granted. Providing the same degree of fire-resistance for the complete roof assembly gives occupants the same protection as if they were on the floor below. We know that the number of people located on a floor or roof can vary including things like events, amusement, meetings, or other reasons. This protects those on the rooftop just as if they were standing on a floor below.

Cost Impact: The code change proposal will increase the cost of construction
This code proposal will increase the cost of construction for the roof assembly by about $1.00 / SF of roof area.

G135-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as the proposed new footnote was confusing and the committee recommended the proponent work with all involved to improve the proposal. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 601

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

Further modify as follows:

2021 International Building Code

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[g] (see Section 202)	3[a, c]	2[a, c, d]	1[c, d]	0[d]	1[c, d]	0	3[a]	2[a]	2[a]	HT	1[c, d]	0
Bearing walls												
Exterior[f, g]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT[h]	1	0
Nonbearing walls and partitions Exterior	See Table 705.5											
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	1 1/2[b, c]	1[b,c, d]	1[b,c, d]	0[d]	1[b,c,d]	0	1 1/2[b]	1[b]	1[b]	HT	1[b,c,d]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Where a roof is an occupiable space, the fire-resistance rating of the ~~roof~~ roof construction ~~assembly~~ shall be equal to or greater than the required rating of the floor below.

c. ~~Except in Group F-1, H, M and S-1 occupancies and where the roof is an occupiable space,~~ Where every part of the roof construction is 20 ft or more above the floor immediately below, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and ~~decking~~ decking ~~where every part of the roof construction is 20 feet or more above any floor immediately below.~~ except where any of the following conditions apply:

   1. In Group F-1, H, M and S-1 occupancies.

   2. Where the roof is occupiable.

   Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

d. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

e. Not less than the fire-resistance rating required by other sections of this code.

f. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

g. Not less than the fire-resistance rating as referenced in Section 704.10.

h. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Commenter's Reason: During the Committee Action Hearings, the General Committee supported the concept behind this proposal. However, there was confusion with the word "Except" in conjunction with the word "and" separating the reference to the occupancies and occupiable space in the revised Footnote c. In order to avoid confusion, this public comment changes the format of Footnote c for a clearer section. Where any of the conditions stated in 1 and 2 apply, the allowance to leave the structural members in the roof construction unprotected when 20 ft or more above the floor below - does not apply. There is also a general clean up of b as well.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This code proposal will increase the cost of construction for the roof assembly by about $1.00 / SF of roof area.

Public Comment# 2887

G136-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	1 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 or mezzanine immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: This section of the code seems to cause a lot of confusion in the field, according to reports to the National Fireproofing Contractors Association. The purpose of this proposal is to bring a key point from the IBC Commentary into the code. It seems the commentary has a graphic that depicts a mezzanine to show visually what this section means -- that the mezzanine located less than 20' below the roof - triggers fire protection of structural members.

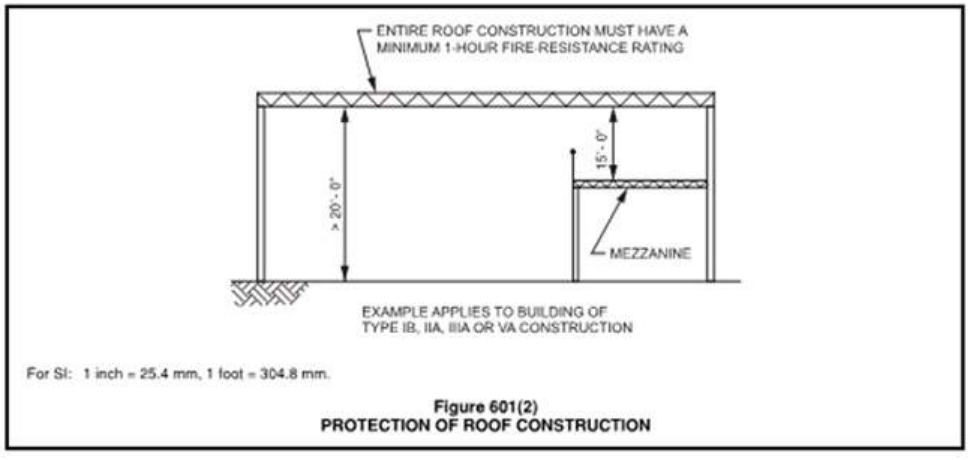

Figure 601(2)
PROTECTION OF ROOF CONSTRUCTION

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since this is a proposal to clarify what is already in the code to eliminate confusion, there is no cost increase or decrease.

G136-21

G136-21

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as submitted as the proposal provides good clarification of the code's intent. (Vote: 14-0)

G137-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Columns shall be provided individual encasement protection on all sides for the full column height to the roof construction. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required*.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: The code states that columns shall be provided individual encasement, full height in the "20' rule" of Table 601b. It seems that in the field according to reports to NFCA, that there is confusion. It is thought that columns do not need protection any higher than 20' above the floor below even if it's a much higher column. This proposal clarifies the point and eliminates confusion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal reflects what is already in the code and therefore does not increase the cost of construction.

G137-21

G137-21

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as the topic is already covered elsewhere in the code (Chapter 7); hence, the change is not required. (Vote: 14-0)

G138-21

IBC: TABLE 601

Proponents: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (bill@mc-hugh.us)

2021 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1\frac{1}{2}$	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Girders, beams, trusses and spandrels that are located less than 20 feet above any floor or mezzanine shall be provided individual encasement protection for the full length. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction, including primary structural frame members, where a 1-hour or less *fire-resistance rating is required.*

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a *fire resistance* rating of not less than 1 hour.

Reason Statement: Table 601 and the footnotes are the most questioned sections of the code according to National Fireproofing Contractors Association's feedback at our events and also in the field. It also seems there is inconsistency in application of this rule in various jurisdictions. This clarifies that the beams are to be protected for their full length for safety.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose of the proposal is to clarify what already exists in the code and therefore does not increase or decrease the cost of construction.

G138-21

G138-21

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved to be consistent with the committee action on G137. The topic is already covered in Chapter 7. (Vote: 14-0)