IBC — General

2021 GROUP A PROPOSED CHANGES TO THE I-CODES

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Virtual Committee Action Hearings

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2021 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

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

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

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

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

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

THIS IS AN 6 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE FUEL GAS CODE COMMITTEE. PART IV WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART V WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART VI WILL BE HEARD BY THE SWIMMING POOL AND SPA CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

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

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

Revise as follows:

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

1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition.
2. Include lettering not less than 3 inches (76 mm) in height with a minimum $^3/_8$-inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS,” or other wording.

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

Exceptions:

1. For one- and two-family dwellings, only the single concentrated *load* required by Section 1607.9.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not ~~accessible to~~ for use by the general public and that have an *occupant load* less than 50, the minimum *load* shall be 20 pounds per foot (0.29 kN/m).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

2021 International Property Maintenance Code

Revise as follows:

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

G1-21 Part I

G1-21 Part II

PART II - IFC: SECTION 202, 504.1, 509.2, 701.6, 2309.5.2.1, 3206.10.1.1, D102.1, L104.6, L104.14.1; IBC: [F] 415.11.7.4, [F] 914.1.1; ICCPC: [F] 2001.3.6

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

2021 International Fire Code

Revise as follows:

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

2021 International Building Code

Revise as follows:

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

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

2. *Ventilation* not less than six air changes per hour shall be provided. The space shall not be used to convey air from any other area.
3. Where the piping or tubing is used to transport HPM liquids, a receptor shall be installed below such piping or tubing. The receptor shall be designed to collect any discharge or leakage and drain it to an *approved* location. The 1-hour enclosure shall not be used as part of the receptor.
4. HPM supply piping and tubing and nonmetallic waste lines shall be separated from the corridor and from occupancies other than Group H-5 by *fire barriers* or by an approved method or assembly that has a *fire-resistance rating* of not less than 1 hour. Access openings into the enclosure shall be protected by approved fire-protection-rated assemblies.
5. ~~Readily accessible manual~~ <u>Ready access to manual</u> or automatic remotely activated fail-safe emergency shutoff valves shall be installed on piping and tubing other than waste lines at the following locations:

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

   5.2. At entries into *corridors*.

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

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

2021 International Code Council Performance Code

Revise as follows:

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

G1-21 Part II

G1-21 Part III

PART III - IFGC: 403.11.7, 404.8.2, 404.14.2, 409.5.3, 409.6, 411.1.6, 501.7.3, 503.5.9, 503.12.6

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

2021 International Fuel Gas Code

Revise as follows:

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

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

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

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

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

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

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

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

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

G1-21 Part III

G1-21 Part IV

PART IV - IPC: 1302.9; IBC: [P]1210.2.2; ICCPC: [P]1204.3.3

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2021 International Plumbing Code

Revise as follows:

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

2021 International Building Code

Revise as follows:

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

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

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

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

2021 International Code Council Performance Code

Revise as follows:

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

G1-21 Part IV

G1-21 Part V

PART V - IMC: 306.1, 506.3.2.2; IFGC: [M]306.1; ICCPC: SECTION 202 (New)

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

2021 International Mechanical Code

Revise as follows:

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

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

Exceptions: This section shall not apply to:

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

2021 International Fuel Gas Code

Revise as follows:

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

2021 International Code Council Performance Code

Add new definition as follows:

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

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

G1-21 Part V

G1-21 Part VI

PART VI - ISPSC: [A]110.1, SECTION 202, SECTION 202 (New), 303.1.1, 306.9, 313.4, 314.5, 324.2, 409.4.3, 504.1, 603.2, 612.5.1, 704.7.3, 704.7.2, 1001.6

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

2021 International Swimming Pool and Spa Code

Add new definition as follows:

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

Delete without substitution:

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

Add new definition as follows:

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

Revise as follows:

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

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

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

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

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

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

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

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

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

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

discharge piping fill with water to the discharge points of all nozzles.
Tanks shall be provided with a means to empty all water in the tank for the purposes of servicing or cleaning.

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

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

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

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

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

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

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

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

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

G1-21 Part VI

G2-21

IBC: SECTION 202 (New)

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

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

2021 International Building Code

Add new definition as follows:

ACCESSIBLE ROUTE. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doors and doorways, gates, ramps, curb ramps excluding the flared sides, blended transitions, elevators and platform lifts. All components of an accessible route shall comply with the applicable portions of this code.

Reason Statement: The term accessible route is found in 131 locations in the 2018 IBC, but the only definition of an accessible route is found in ICC A117.1. This change simply injects that definition into the IBC so that the scope of requirements to design and approve an accessible route is clear and easily understood.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The clarification of what is intended as an accessible route will decrease any confusion over the use of the term and should reduce the cost of time for designers and code officials to clearly understand the codes intent.

G2-21

G3-21 Part I

PART I - IBC: 1026.4.1 (IFC: 1026.4.1)
PART II - IFC: 805.2, 808.1
PART III - IPC: SECTION 202(New), 609.1
PART IV - IMC: SECTION 202(New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART IV WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than *24-hour basis* to persons who are rendered *incapable of self-preservation* by the services provided or staff has accepted responsibility for care recipients already incapable.

Revise as follows:

1026.4.1 Capacity. The capacity of the refuge area shall be computed based on a *net floor area* allowance of 3 square feet (0.2787 m^2) for each occupant to be accommodated therein. Where the *horizontal exit* also forms a *smoke compartment*, the capacity of the refuge area for Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall comply with Sections 407.5.3, 408.6.2, 420.6.1 and 422.3.2 as applicable.

G3-21 Part I

G3-21 Part II

PART II - IFC: 805.2, 808.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Fire Code

Revise as follows:

805.2 Group I-2 and ~~Group B~~ ambulatory care facilities. The requirements in Sections 805.2.1 through 805.2.2 shall apply to Group I-2 occupancies and ~~Group B~~ ambulatory care facilities.

808.1 Wastebaskets and linen containers in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities. Wastebaskets, linen containers and other waste containers, including their lids, located in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509.1 of the International Building Code.

Exception: Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.

G3-21 Part II

G3-21 Part III

PART III - IPC: SECTION 202(New), 609.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Plumbing Code

Add new definition as follows:

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

Revise as follows:

609.1 Scope. This section shall govern those aspects of health care plumbing systems that differ from plumbing systems in other structures. Health care plumbing systems shall conform to the requirements of this section in addition to the other requirements of this code. The provisions of this section shall apply to the special devices and equipment installed and maintained in the following *occupancies*: Group I-1, Group I- 2, ~~Group B~~ ambulatory care facilities, medical offices, research and testing laboratories, and Group F facilities manufacturing pharmaceutical drugs and medicines.

G3-21 Part III

G3-21 Part IV

PART IV - IMC: SECTION 202(New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Mechanical Code

Add new definition as follows:

[BG] AMBULATORY CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

Reason Statement: The term “ambulatory care facility” is currently defined in the IBC and IFC. It should be defined in the other codes where the term is used. When this item was first introduced to the codes, it was believed that it was needed to add ‘Group B’ in front of the term. This proposal removes it as no longer necessary, and will make this consistent with the numerous other locations throughout the codes where ‘Group B’ in not included. The intent is to not appear to have two different types of ‘ambulatory care facilities’.
There will also be a Group B proposal to IEBC to add the definition and correct the terms in 302.2.1, 503.15 and 805.11.

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

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Cost Impact: The code change proposal will not increase or decrease the cost of construction
This an editorial clarification for consistent terminology

G3-21 Part IV

G4-21

IBC: 202 (New)

Proponents: Jason Phelps, City of Hillsboro, representing City of Hillsboro (jason.phelps@hillsboro-oregon.gov)

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

2021 International Building Code

Add new definition as follows:

<u>**CONCEALED SPACE.** . Concealed spaces are non-occupied spaces that are created by building construction, such as the space above the ceiling, the attic, the crawl space, or the space behind a wall. Concealed spaces shall meet all the applicable requirements of the *International Fire Code*, the *International Mechanical Code* and Chapter 7 of the *International Building Code.* Concealed spaces shall not contain hazardous material storage or use.</u>

Reason Statement: A definition of concealed space added to the code is a good idea. I am surprised that there isn't one already?!
Additionally, Semi-conductor facilities in South-East Asia have walkable ceilings that create a concealed space considered as the Interstitial Level.

These spaces can currently be used for hazardous material storage as there is nothing specifically in the code to prevent it.

Semi-conductor facilities have evolved impressively over the last 30 years, with only industry looking at how the code is outdated compared to today's facilities.

While many significant improvements have been made in sprinkler protection, hazardous exhaust, and automatic controls, there are other areas that need to be addressed.

The code could never have anticipated that hazardous materials would be stored and used in a concealed space. This presents a potential hazard to the building and a definite hazard to the occupants.

Hazardous material storage and distribution equipment requires maintenance and monitoring, as well as a continuous flux of adding and changing processes. This requires a significant number of workers to be present on a regular basis, they are gowned up and surrounded by toxic chemicals, this should always be done in an occupied space.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction, as it is something that should technically not be allowed currently.

G4-21

G5-21

IBC: SECTION 202, (New)

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

Revise as follows:

[BG] CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living.*Custodial care* includes persons receiving care who have the ability to respond to emergency situations and <u>may receive limited verbal or physical assistance. These care recipients may </u>evacuate at a slower rate and/or who have mental and psychiatric complications.

[BG] INCAPABLE OF SELF-PRESERVATION. Persons who, because of age, physical limitations, mental limitations, chemical dependency or medical treatment, cannot respond as an individual to an emergency situation.

Add new definition as follows:

<u>**LIMITED VERBAL OR PHYSICAL ASSISTANCE.** Persons who, because of age, physical limitations, cognitive limitations, treatment or chemical dependency, and may not independently recognize, respond or evacuate without limited verbal or physical assistance during an emergency situation. Verbal assistance includes prompting, giving and repeating instructions. Physical assistance includes assistance with transfers to walking aids or mobility devices and assistance with egress.</u>

Reason Statement: The intent of this code change is to provide a new definition for Limited Verbal or Physical Assistance to correlate with the text of the existing document (Section 308.2.2 and 310.5.2) and provide needed clarity. This new definition describes a middle ground between able to evacuate independently and incapable of self-preservation. The I-1/R-4, Condition 2 occupancy group classification was added into the code, providing safeguards for care-recipients who, because of frailness, cognitive impairment or other conditions, need limited verbal or physical assistance with exiting the building. The intent, which was described in more detail in the Commentary, was to allow staff to assist care-recipients during evacuation, who may use mobility devices (walker or cane) or can self-propel in a wheelchair, with transferring out of bed, assist with balance while assistance with walking down stairs, or allow staff to physically assist care-recipients who do not use mobility devices to hold hands or arms, assist with balance, or provide other similar limited physical assistance. It also recognizes that people with dementia may need extra prompting or repeated instructions to complete the evacuation process. This definition is being added in response to some requests for clarity on what limited assistance means.
The Custodial Care definition is also being modified to better clarify and link that I-1/R-4 Occupancies, who receive Custodial Care, are able to receive Limited Verbal and Physical Assistance. The new “limited assistance” definition is also written to differentiate it from the current definition for Incapable of Self-Preservation. The Incapable of Self Preservation definition applies to occupants who “cannot respond as an individual to an emergency situation.” This means they are not able to act independently or as an individual at all, during an emergency situation. Being unable to “respond as an individual” includes persons who may be mostly or completely incapacitated, semiconscious or unconscious, or who may be on life support. The new “limited assistance” definition purposely does not include these incapacitated persons. It instead limits helping individuals who can respond but may need , limited assistance with mobility and prompting.

The term 'limited verbal or physical assistance' is currently used in Group I-1, condition 2 (Section 308.2.2) and Group R-4, Condition 2 (Section 310.5.2).

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is clarifying a term currently used in the code. There are no technical changes for construction.

G5-21

G6-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IFC: SECTION 202 (New)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE. PART I AND II WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE.

2021 International Building Code

Add new definition as follows:

EXIT STAIRWAY. Where the term "exit stairway" is used without specifying *interior exit stairway* or *exterior exit stairway*, "exit stairway" includes both *interior exit stairway* and *exterior exit stairway*.

G6-21 Part I

G6-21 Part II

PART II - IFC: SECTION 202 (New)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Add new definition as follows:

EXIT STAIRWAY. Where the term "exit stairway" is used without specifying interior exit stairway or exterior exit stairway, "exit stairway" includes both interior exit stairway and exterior exit stairway.

Reason Statement: In large part, the ICC codes reference exit stairways as either an "interior exit stairway" or an "exterior exit stairway" or both to make use of the defined terms. However, there are many occurrences of the the term "exit stairway" that do not specify either interior or exterior, and that presumably mean both options when the term is used without qualification. But, this is not stated, and there is currently no definition of "exit stairway" alone. The two ways to address this are going through the codes and clarifying interior and exterior in every case where the term "exit stairway" appears on its own, or providing a definition to correlate with use of the general term. After looking at the number of occurrences requiring a change to add interior, exterior or both where "exit stairway" is used on its own, it was readily apparent that the approach of adding a definition was much simpler.
To ensure that this issue gets considered in the development process for the 2024 edition, I've provided this proposal. If others prefer the verbose approach of not adding a definition, as proposed here, and instead fixing individual occurrences of "exit stairway," it would appear that this proposal would open the door for a modification that takes that approach.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial clarification. This proposal does not make technical changes to the code.

G6-21 Part II

G7-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IFC: SECTION 202 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

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

2021 International Building Code

Add new definition as follows:

FIRE PERFORMANCE. Manner in which a material, product, or assembly responds to a particular fire exposure, including, but not limited to, ease of ignition, flame spread, heat release, mass loss, smoke generation, and fire resistance.

G7-21 Part I

G7-21 Part II

PART II - IFC: SECTION 202 (New)

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Fire Code

Add new definition as follows:

FIRE PERFORMANCE. Manner in which a material, product, or assembly responds to a particular fire exposure, including, but not limited to, ease of ignition, flame spread, heat release, mass loss, smoke generation, and fire resistance.

Reason Statement: The term "fire performance" is used multiple times in the I codes, but it is not defined. It is an important concept that must not be confused with "fire resistance, which is one aspect of fire performance. This proposal recommends adding the same definition into the IBC and into the IFC.
The term fire performance combines the concept of "fire resistance", which is defined in the IBC, and the concept of "reaction to fire", which is not defined in the I-codes, but the concept is used frequently. Fire resistance is defined in the IBC as: "That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use." In other words, fire resistance is the property of a material that prevents or retards fire from penetrating from one compartment to another. "Reaction to fire" is a term defined by the ASTM committee on fire standards as: "response of a material in contributing by its own decomposition to a fire to which it is exposed, under specified conditions." In other words, reaction to fire is what a material does when it is exposed to fire, in terms of igniting, spreading flame, releasing heat or smoke, or otherwise causing potential harm to people or products.

The term "fire resistance", which is associated with fire resistance ratings (typically determined by testing in accordance with ASTM E119 or UL 263) is used often in the codes and may be confused with "fire performance", and that is why this definition is needed.

Uses of the term "fire performance" in I-codes:

In the IBC: 802.1, 802.2, 802.3, 803.1, 806., and in the discussion about chapter 7.

In the IRC: 302.13,

In the IFC: 803.1, 805.3.2.2, 807.3

In the IEBC: Resource A

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply adds a definition.

G7-21 Part II

G8-21

IBC: SECTION 202

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

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

2021 International Building Code

Revise as follows:

[BF] FIRE PROTECTION RATING. The period of time that an opening protective <u>prevents or retards the passage of excessive flames</u> ~~will maintain the ability~~ to confine a fire as determined by tests specified in Section 716. Ratings are stated in hours or minutes.

[BF] FIRE RESISTANCE. That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use.

Reason Statement: The term “fire resistance” is used in the IBC to generically refer to certain fire properties of assemblies. The definition of “fire protection rating” does not specifically identify the properties associated with the ratings. The proposed language is intended to clarify the performance of an assembly that has a fire protection rating.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal simply clarifies an existing definition in the IBC and is not intended to result in any technical change to the requirements of the IBC.

G8-21

G9-21

IBC: 202 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

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

2021 International Building Code

Add new definition as follows:

FLASHING. A corrosion-resistant, water-resistant material or system, installed to resist water entry, and to direct water away from or out of the building assembly.

Reason Statement: The term "flashing" occurs in many sections of the IBC and over 50 sections of the IRC. As described in these sections of the code, flashing is required to prevent water from entering the interior of a buildingn at roof/wall penetrations, the perimeter of windows and doors, etc. Traditionally, flashing is thought of as metal. However, innovation has brought to the market non-metal flashings such as butyl and acrylic tapes and liquid-applied products that meet the criteria for preventing water penetration. The use of a combination of materials has resulted in flashing systems, in which the individual components are tested along with the entire system and found to meet the applicable performance criteria.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is intended to create a new definition only. It does not create nor modify any technical requirements.

G9-21

G10-21

IBC: SECTION 202 (IFC[BE] SECTION 202)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

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

2021 International Building Code

Revise as follows:

[BE] FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as *corridors*, *stairways*, *ramps*, toilet rooms, <u>elevator lobbies,</u> mechanical rooms and closets.

Reason Statement: Elevator lobbies are used in some buildings to provide the hoistway protection required by 3006.2. Additionally, fire service access elevator lobbies are required in certain high-rise buildings by IBC 403.6.1 and 3007.6. Occupant evacuation elevator lobbies may be provided in accordance with IBC 403.5.2 (exception 1) and 3008.6.
In uses for which the occupant load is calculated using the gross floor area (such as business or residential), the area of elevator lobbies must be included in the gross floor area. However, in uses for which the occupant load is calculated using the net floor area (such as assembly), it is not necessary to include the area of elevator lobbies in the net floor area. Elevator lobbies are only occupied on a transient basis as people move to or from their destination As such, the area of elevator lobbies should not be included in the net floor area, just like the area of stairs, corridors and bathrooms are currently excluded from the net floor area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is submitted to clarify requirements. No cost impact is anticipated.

G10-21

G11-21

IBC: SECTION 202 (IFC[BE] SECTION 202)

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

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

2021 International Building Code

Revise as follows:

[BE] GUARD. A <u>vertical</u> building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

Reason Statement: Surprisingly, the code does not currently provide guidance regarding the orientation of a guardrail. Although not typical, some guards have been designed at angles of 45 degrees or more from the vertical orientation which does not provide adequate safety when pedestrians are traversing adjacent to changes in elevation of 30 inches or more. The proposed change is consistent with the current definition of 'Wall' found in IBC Chapter 2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change will not increase the cost of construction. The intent is to improve the safety for pedestrians.

G11-21

G12-21

IBC: SECTION 202

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

2021 International Building Code

Revise as follows:

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

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

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

This would be consistent with the change to Section 503.1.4 –

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

Exceptions:

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

2. (no change to this exception)

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

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

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

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

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

G13-21

IBC: 503.1.4

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

2021 International Building Code

Revise as follows:

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

Exceptions:

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

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

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

G13-21

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 <u>or roof</u> 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

G15-21

IBC: SECTION 202

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

2021 International Building Code

Revise as follows:

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

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

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

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

G15-21

G16-21

IBC: SECTION 202

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

2021 International Building Code

Revise as follows:

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

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

Reason Statement: In an October, 2019 article titled 'Through the roof: Occupied roofs in the 2018 IBC', Kim Paarlberg writes that “What has not been clarified is if an occupied roof is considered an occupied floor when determining does or does not have to meet the high-rise provisions in the code (definition of “high-rise building” and Section 403)”. This code change is intended to address this lack of clarity.

High-rise buildings utilizing the new regulations in the 2021 IBC for occupied roofs are gaining in popularity with building owners and designers. In the current definition of *High-rise building*, we measure from the lowest level of fire department vehicle access to the highest ‘occupied floor’ and if located more than 75 feet above this point then it is considered a *high-rise building.* What is not clear is if an occupied roof is considered the same as an occupied floor. This code change corrects this ambiguity by adding an occupied roof with an occupant load of 50 or more to the definition. The proposal includes a threshold of 50 people before the occupied roof is applicable to the definition because it was felt that less than 50 is not considered to be assembly and with less than 50 people, it would be manageable in terms of meeting a timed egress analysis to get the occupants to a safe location.

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

Cost Impact: The code change proposal will increase the cost of construction

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

G16-21

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 l~~ 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:

$$R = [C_1(W/D) + C_2]h$$ **(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:

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

where:

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

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

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

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

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

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

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

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

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

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

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

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

G17-21

G18-21

IBC: SECTION 202

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

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

2021 International Building Code

Revise as follows:

[BF] NONCOMBUSTIBLE PROTECTION (FOR MASS TIMBER AND TYPE IV CONSTRUCTION). Noncombustible material, in accordance with Section 703.6, designed to increase the *fire-resistance rating* and delay the combustion of *mass timber* or *fire retardant treated wood* permitted in Type IV construction.

Reason Statement: There are instances in Type IV A, B and C construction where it is appropriate from a performance standpoint to allow Fire Resistant Treated Wood (FRTW). Since FRTW would add to the fuel load if burned, it is also appropriate to specify the quantity of noncombustible protection that should protect it and thus limit the FRTW contribution to fuel in type IV construction. The acceptance requirements for FRTW in IBC 2303.2 deal with flame spread and have nothing to do with the amount of energy given off by FRTW when consumed by a fire. As with the mass timber in Type IV A, B and C construction this term is helpful to describe noncombustible protection material that can be required to delay consumption and increase fire resistance of the FRTW when used in Type IV construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change clarifies a definition and does not increase or decrease the cost of construction.

G18-21

G19-21

IBC: 202 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

OCCUPIABLE. Capable of being occupied by humans or fit for human occupancy.

Reason Statement: The purpose of this proposal is to open an opportunity to create an IBC definition of the single word "occupiable." The word "occupiable" is used in many locations throughout the IBC without a definition.
Section 201.4 of the 2021 IBC states: "Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies." In the 2021 International Fire Code, Section 201.4 includes an additional sentence: "*Merriam Webster's Collegiate Dictionary, 11th Edition,* shall be considered as providing ordinarily accepted meanings."

The Merriam Webster's 11th Edition definition of the word “occupiable” is: “capable of being occupied or fit for occupancy (for example, ‘an occupiable room’)”

Notice that one word that is missing from the Merriam Webster definition is the word "human."While creating other proposals to respond to questions about fire concerns for overhead photovoltaic support structures, the topic repeatedly came up about definitions. Occupiable is used throughout the IBC. Occupiable space is defined but is too restrictive and does not apply to any use case that is not "a room or enclosed space."

The existing definition of "occupiable space" is included here for reference only.

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

Note that stakeholders will encounter proposals that seek to create or revise definitions for:

* Occupiable

* Occupiable space

* Occupiable space, exterior

* Occupiable space, rooftop

This proponent is open to suggestions from other stakeholders as to best solutions to create, revise, and correct these definitions so they work for all stakeholders.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal creates a new definition only. It does not create or revise any technical requirements.

G19-21

G20-21 Part I

PART I - IBC: SECTION 202 (New), 302.1, 503.1.4, 503.1.4.1, 1004.7, 1006.1, 1006.3, 1006.3.1, 1006.3.2, 1006.3.3, 1006.3.4, 1009.2.1, 1011.12, 1011.12.2, 1011.14, 1011.15, 1011.16, 1019.3, 1104.4; (IFC[BE]1004.7, 1006.1, 1006.3, 1006.3.1, 1006.3.2, 1006.3.4, 1006.3.3, 1009.2.1, 1011.12, 1011.12.2, 1011.14, 1011.15, 1011.16, 1019.3, 1104.4)

PART II - IFC: SECTION 202 (New), 903.2.1.6 (IBC[F] 903.2.1.6)

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

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

2021 International Building Code

Add new definition as follows:

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

Revise as follows:

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

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

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

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

Exceptions:

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

2. Assembly occupancies shall be permitted on roofs of open parking spaces of Type I or Type II construction, in accordance with the exception to Section 903.2.1.6.

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

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

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

Exceptions:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

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

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

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

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

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

Exceptions:

1. *Exit access stairways* and *ramps* that serve or atmospherically communicate between only two adjacent stories. Such interconnected stories shall not be open to other stories.

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

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

Exceptions:

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

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

G20-21 Part I

G20-21 Part II

PART II - IFC: SECTION 202 (New), 903.2.1.6 (IBC[F] 903.2.1.6)

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

2021 International Fire Code

Add new definition as follows:

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

Revise as follows:

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

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

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

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

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

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

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

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

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

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

G20-21 Part II

G21-21

IBC: SECTION 202

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

2021 International Building Code

Revise as follows:

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

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

Reason Statement: This proposal is meant to clarify the definition for "occupiable space". When reviewing the 2021 IBC, it seems that an occupiable roof is not included in the definition of occupiable space. There has been a trend in recent years that the roof is now a place to have an event, amusement, or similar purpose. Without including the roof in the occupiable space definition, it does not get the same protection as the occupiable floor below it. The rationale might be, 'it's not as many people', or some other reason. During the 2008 recession, floors in office buildings had reduced occupant loads. Did we remove code required protection of that floor because there were less occupants? No.
Adding the word 'roof' to the definition of occupiable space will mean building safety requirements become required for the occupiable roof, with the exceptions that currently exist. However, when an 'amusement' takes place of any kind, people on the roof deserve the same protection as if they were on the floor below.

Cost Impact: The code change proposal will increase the cost of construction
If the interpretation that protection on an occupied roof is needed in only a few places, or not equal to the floor below, then this will increase the cost of construction.

G21-21

G22-21

IBC: SECTION 202

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Revise as follows:

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

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

Reason Statement: It is important to note the word "occupiable" is used in many locations within the IBC, without an IBC definition. It is also important to note the terms "occupiable" and "occupiable space" are generally understood to have the meaning that humans could be there.
The existing definition of "occupiable space" in the 2021 IBC is inadequate because it is constrained to "rooms or enclosed spaces." Therefore, the term "occupiable space" does not adequately or correctly represent any space that is designed for human occupancy but is not interior to a building in "a room or enclosed space."

For example, the current definition of "occupiable space" is not suitable to "occupiable roofs" or other outdoor spaces where humans can congregate.

The definition of "exterior occupiable space" is addressed in a separate but related proposal. Further, another proposal for "occupiable PV support structures" could make use of a new definition for exterior occupiable space if successful, but is not dependent on approval of that definition. Yet another proposal seeks to define the single word "occupiable."

The proponent is open to suggestion, and hopes that several related proposal related to "occupiable" will trigger some collaboration among stakeholders to solve multiple problems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is for revision of an existing definition only. It does not create nor modify any technical requirements.

G22-21

G23-21

IBC: SECTION 202 (New)

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

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

2021 International Building Code

Add new definition as follows:

OVERHEAD DOOR STOP. Door hardware mounted at the top of the door and / or to the door frame which limits the opening of the door.

Reason Statement: Proposal E41-18 revised the 2021 IBC to permit installation of overhead door stops where the overhead door stop encroaches into the door opening at the top of the opening. See the exception to 2021 IBC Section 1010.1.1.1. During review of the changes to the 2021 IBC, it was noted a definition (and picture) of an overhead door stop would be helpful with differentiating this door hardware item from the stop of the door frame at the top of the door opening. An “overhead door stop” is door hardware mounted at the top of a swinging door and / or to the door frame which limits opening of the door. Overhead door stops are an alternative to door stops screwed to the floor or to the wall. Most overhead door stops encroach slightly into the top of the doorway opening. Overhead door stops may also incorporate friction or damping to dampen the swinging of a door. An overhead door stop may have a “catch” to help hold the door in an open position.

Overhead door stop.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is not a change in requirements - just a definition for a term already used in the code.

G23-21

G24-21

IBC: SECTION 202(New)

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

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

2021 International Building Code

Add new definition as follows:

PLASTIC VENEER. Plastic materials that are installed as interior finish, or on the exterior surface of exterior walls and are used as decorative or signage media in limited quantities.

Reason Statement: Since before the creation of ICC, the term Plastic Veneer has not been defined by the building code. It has always been assumed as being decorative in nature, limited in use, and used as signage on or in buildings. The 2021 IBC has an entire section devoted to these plastic veneers without a true definition of what they are, Section 2605.
The reason for this definition is to provide clarity to code officials, architects, developers, and engineers alike who have misidentified veneers in the past as plastic veneers when they are clearly not. The example that comes to mind is a state code official determined that an EIFS system could not be installed on a building in a Fire District when Appendix D of the IBC is adopted. The state code official determined, in their opinion, that EIFS are a plastic veneer and are subject to Section D102.2.11; which states “exterior plastic veneer is not permitted in the fire district”.

The term Plastic Veneer is not defined in the current 2021 Edition of the IBC; even though there is a stand-alone section IBC for Plastic Veneers (Section 2605). Generally speaking, the industry considers Plastic Veneers used on the exterior of a building to be constructed of solid plastic (Plexiglas for example) and adhered/fastened directly to the exterior wall assembly. These solid Plastic Veneers are used as decorative features or trim on the surface of the exterior wall for accent purposes (added color, accent lighting, signage, etc). When Plastic Veneers are used on the exterior of a typical building, Section 2605.2 restricts the usage of these types of materials on exterior walls due to their potential flammability. These restrictions include maximum allowable coverage area and maximum building height requirements. Additionally, this section states that the Plastic Veneer shall comply with the fire performance specifications similar to those used to qualify Light Transmitting Plastics, Section 2606.4. This specification section (Section 2606.4) outlines the necessary fire performance criteria and small-scale tests that need to be conducted in order comply with the code: minimum self-ignition temperature, smoke development index or smoke density rating, and burning rate or time of burning. It should be noted that the burning rate or time of burning test only uses a small-scale Bunsen-burner type flame to evaluate the materials flammability. The resulting tested Plastic Veneer material shall be classified as a CC1 or CC2 combustibility class per ASTM D635, *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*. In review of Section 2606.4 IBC Code Commentary, “Class CC1 plastic generally consist of polycarbonate materials whereas Class CC2 plastics consist of acrylics.”

A definition is needed to define a Plastic Veneer so other veneer systems are not misidentified and prohibited from being used.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact associated with this proposal as this proposal is simply adding a definition to the code to provide clarity.

G24-21

G25-21

IBC: SECTION 202

Proponents: William Conner, American Society of Theatre Consultants, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

Revise as follows:

[BG] PLATFORM. A raised area within a building used for worship, the presentation of music, plays or other entertainment; the head table for special guests; the raised area for lecturers and speakers; boxing and wrestling rings;~~theater-in-the-round *stages*~~; and similar purposes wherein, other than horizontal sliding curtains, there are no overhead hanging curtains, drops, scenery or stage effects other than lighting and ~~sound audio~~ <u>audio visual equipment.</u> A temporary platform is one installed for not more than 30 days.

Reason Statement: The deletion of “theatre-in-the-round stages” omits exempting spaces from stage requirements where combustible scenery is possible or likely to be used.
The change of “sound” to “audio/visual equipment” recognizes the prevalence of projection screens, projectors, and similar video display equipment in addition to sound equipment found in many spaces these days.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It could be argued that this will increase the cost of a theatre in the round, but they should never have been exempted from the stage requirements originally. I believe that few have been built that have not complied with most stage requirements.

G25-21

G26-21

IBC: SECTION 202

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

2021 International Building Code

Revise as follows:

[BG] PRIMARY STRUCTURAL FRAME. The primary structural frame shall include all of the following structural members:

1. The columns.
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
3. Members or portions of the floor construction and roof construction having direct connections to the columns that are essential to the vertical stability of the primary structural frame under gravity loading.
4. Members or portions of the structure that are essential to the vertical stability of the *primary structural frame* under gravity loading.

Reason Statement: In a two way concrete slab or two way mass timber floor floor system the two way system is connected directly to the columns yet the entire concrete slab or mass timber system is not essential to the vertical performance of the system. In a type IA or IVA building the primary structural frame is required to be of 3 hour construction and the floor or roof system is allowed to be of lesser fire resistance rating in table 601. It is feasible to provide extra protection or thickness of the two way system along portions of the floor or roof system between columns (width to be determined by analysis) that is essential for the stability of the columns and allow the remaining center portion of the two way slab or mass timber floor system to fail by burning through. Requiring the entire two way system to be protected for 3 hours just because a portion is connected to the columns repetitively adds considerable dead load to a multi story building with no gain in performance over a beam and column type of frame system that is allowed to have two hour floors with a three hour primary frame.

Cost Impact: The code change proposal will decrease the cost of construction
There is an opportunity for substantial savings when portions of a two way slab or two way mass timber floor or roof system that are not essential to vertical performance can be rated as specified in Table 601 rather than required to having a 3 hour fire resistance rating.

G26-21

G27-21

IBC: (New)

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

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

2021 International Building Code

Add new definition as follows:

PROJECTION. (For application of Chapter 7 only.) Construction extending beyond the exterior wall that is wholly supported by the building to which it is attached.

Reason Statement: The material of construction and fire-resistance rating of projections can differ from that of the rest of the construction of the enclosed building. This proposal is intended to clarify what construction is actually regulated by the projection provisions, by adding a definition.
The definition proposed here would take a stand on whether elements of construction that occur beyond the exterior wall, but are supported by their own columns, walls, or other vertical elements that extend all the way to the ground, are or are not projections.The intent is to ensure that large areas of construction taking place outside exterior walls do not use the reduced fire-resistance rating and materials of construction associated with projections, thereby reducing the fire safety of buildings. Even though these elements are not enclosed, like the interior of a building, if they are large enough in extent then they start to behave more like enclosed space does during a fire.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed definition is only a clarification of what is already present in the code.

G27-21

G28-21

IBC: SECTION 202

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

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

2021 International Building Code

Revise as follows:

[BE] PUBLIC-USE AREAS. Interior or exterior rooms or spaces that are made available to the general public. <u>A public entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.</u>

[BE] RESTRICTED ENTRANCE. An entrance that is made available for common use on a controlled basis, but not public use, and that is not a*service entrance*. <u>A service entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.</u>

[BE] SERVICE ENTRANCE. An entrance intended primarily for delivery of goods or services. <u>A restricted entrance may be a door, or two or more doors in one opening such as a pair of doors or a bank of doors.</u>

Reason Statement: The intent of this proposal is to clarify that an entrance may be a door, or may be multiple adjacent doors. This is done by adding to the definitions of public entrance, service entrance, and restricted entrance to address entrances which are a pair of doors or a bank of doors.

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

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

G28-21

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-<u>RESISTIVE</u> ~~RESISTANT~~ MATERIALS. Cementitious or fibrous materials that are sprayed to provide fire-resistant protection of the substrates.

403.2.3 Sprayed fire-<u>resistive</u> ~~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-<u>resistive</u> ~~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.

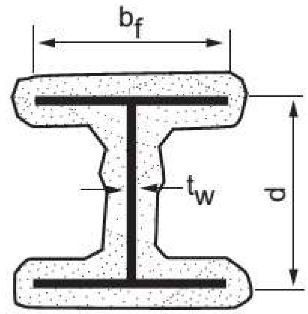


FIGURE 722.5.1(5)
WIDE FLANGE STRUCTURAL STEEL COLUMNS WITH SPRAYED FIRE-RESISTIVE ~~RESISTANT~~ MATERIALS

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:

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

where:

R = *Fire resistance* (minutes).

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

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

C_1 and C_2 = Material-dependent constants.

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

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

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

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

$$h_2 = h_1 [(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60]$$ **(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

G30-21

IBC: SECTION 202

Proponents: Gregory Benton, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov)

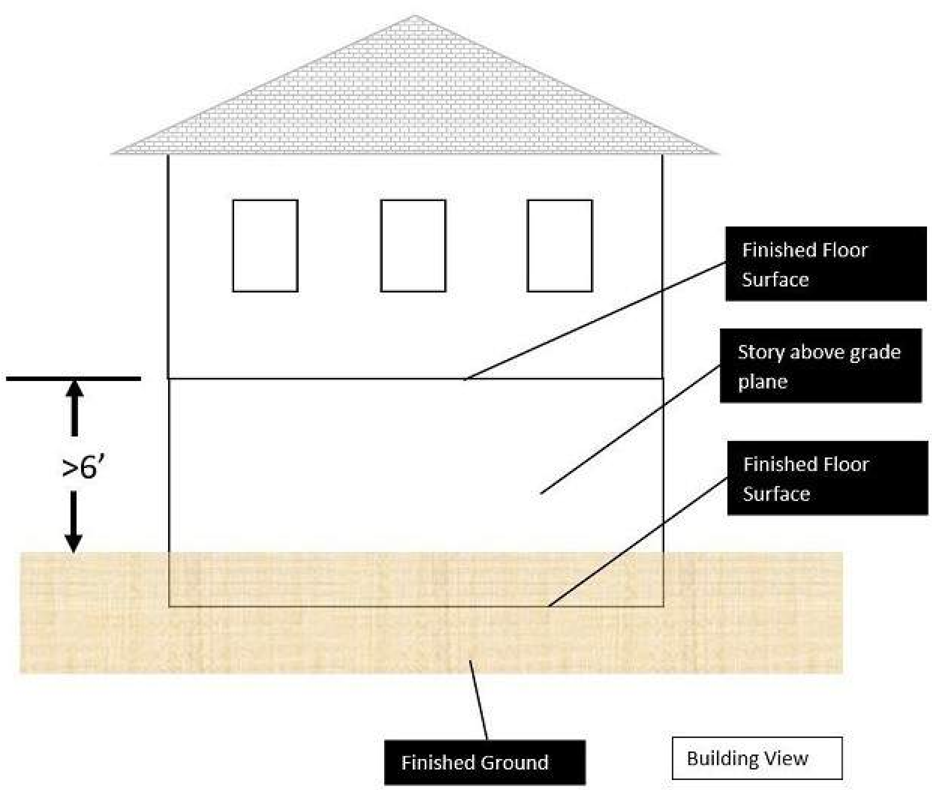
2021 International Building Code

Revise as follows:

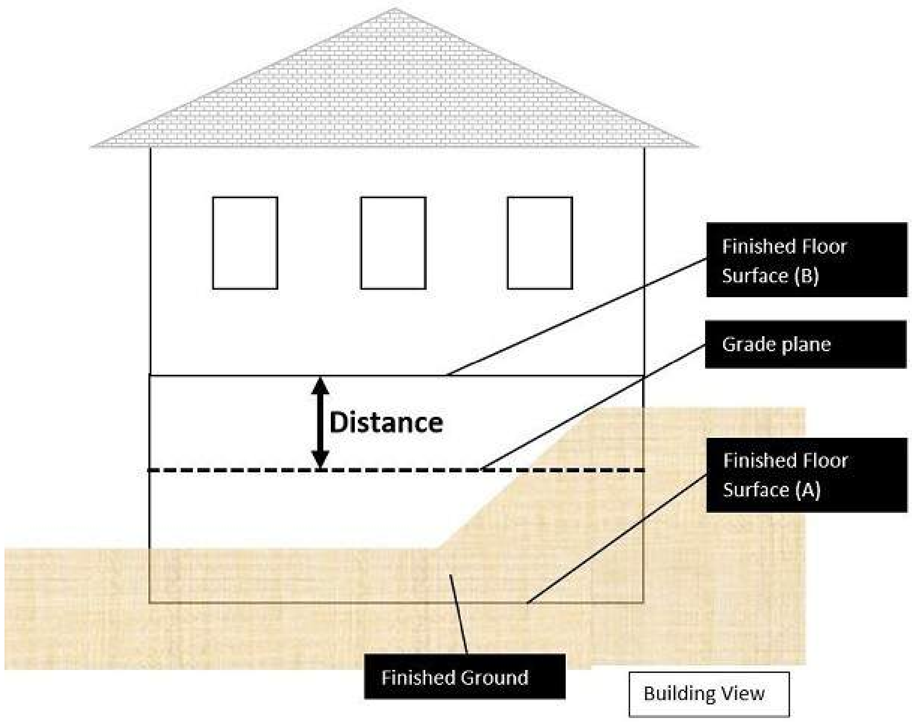
[BG] STORY ABOVE GRADE PLANE. Any*story* having its finished floor surface entirely above *grade plane*, or in which the finished surface of the floor next above is:

1. More than 6 feet (1829 mm) above *grade plane*; or
2. <u>More than 6 feet (1829 mm) above the finished ground level for more than 50 percent of the total building perimeter.</u>
3. More than 12 feet (3658 mm) above the finished ground level at any point.

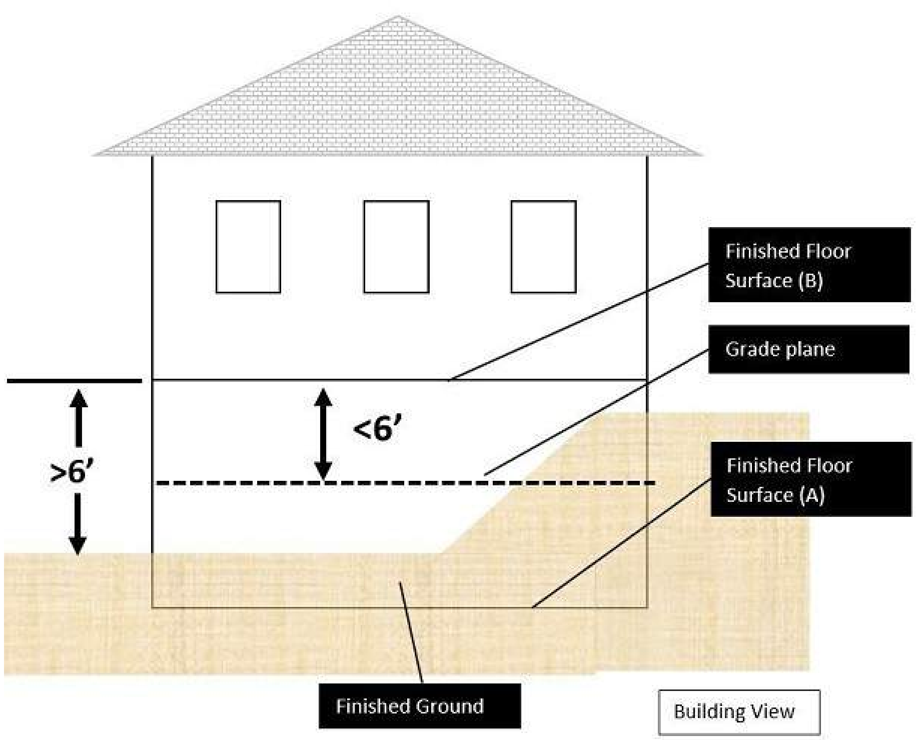
Reason Statement: When the entirety of a finished floor surface is not above *grade plane* the current code provisions describe two different scenarios that will still define it as a *story above grade plane*. The first provision specifies that the finished floor surface will be considered a story above *grade plane* if the finished story next above is more than 6 feet (1829 mm) above *grade plane*, where *grade plane* is defined as a "reference plane representing the average of the finished ground level adjoining the building at all exterior walls." A hypothetical simple example can be imagined with a level finished ground level, which is shown below, that fulfills this requirement.



Not all buildings and dwellings are constructed on level finished ground and can instead be constructed on uneven finished ground as shown below. According to the current code provisions, if the dimension labeled 'distance' is greater than 6' then the finished floor surface (A) corresponds to a *story above grade plane*.



The proposed change to the code applies to the figure below because more than 50 percent of the total building perimeter is more than 6 feet (1829 mm) above the finished ground level. In the figure below the current code provisions would not characterize the finished floor surface (A) as part of a story above grade plane and would instead finished floor surface (B) would apply to the first *story above grade plane*.



This code change proposal will only increase by 1 the number of stories above grade plane in a building/dwelling that fulfills the code stipulation but will never decrease the number of stories above grade plane. As such, adding an additional story above grade plane to a building/dwelling will inherently result in greater restrictions regarding maximum building area limitations and possibly requiring a sprinkler system.

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal could result in buildings/dwellings being characterized has having 1 additional story above grade plane when compared to the number of stories above grade plane when using the previous code provisions. The additional story above grade plane could result in a building/dwelling to require a sprinkler system.

G30-21

G31-21

IBC: 303.1.3

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

303.1.3 Associated with Group E occupancies. ~~A room or space used~~ The use of a building or structure, or a portion thereof, for assembly purposes that is primarily associated with a Group E occupancy is not considered a separate occupancy.

Reason Statement: The current wording does not take into account for campus designs within our school properties.
Certain conditions of separate gymnasium buildings create a list of issues if the building is designated as a A occupancy.
The gymnasium or other assembly area associated with an E occupancy should not be treated differently if it is connected to the building or separated.
"Primarily" was added due to the possibility of designers attempting to use the provision for buildings or areas such as public theaters, churches, community centers, stadiums or public pools that should be designated as A.

Cost Impact: The code change proposal will decrease the cost of construction
rare occurring issue with possibly significant reductions

G31-21

G32-21

IBC: 304.1, 306.2, 311.2

Proponents: Robert J Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2021 International Building Code

Revise as follows:

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

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

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

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- <u>Energy storage systems (ESS) and equipment containing lithium-ion or lithium metal batteries</u>
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more

than 2,500 square feet (232 m^2) in area

- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Lithium-ion batteries
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Vehicles powered by lithium-ion or lithium metal batteries
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

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

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lithium-ion or lithium Metal batteries
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps

- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Vehicle repair garages for vehicles powered by lithium-ion or lithium metal batteries
- Wax candles

Reason Statement: Over the last few cycles there have been a series of proposals dealing with energy storage systems that have highlighted the fire potential presented by lithium-ion and lithium metal batteries. Energy storage systems typically are installed in an occupancy with the proper protection and the occupancy of the building does not change. This is because the fire code provides for the appropriate safety levels for the installations. As part of the work done last cycle Energy Storage Systems in dedicated use buildings where there can be gigawatts of energy present was added to the F-1 Group. There are many other activities involving lithium-ion or lithium metal batteries that also belong in the appropriate Group but because they are not listed there is a problem in cases where the local code officials default to an unnecessary H Group designation. This cycle, in addition to updating the ESS requirements there are proposals to address battery storage safety and to specify requirements for emergency action plans, suppression and detection for the B, F M and S Group activities. The activities are no different than others as far as Group designation when the appropriate level of protection exists. This proposal complements those activities by putting various activities involving lithium-ion or lithium metal batteries in the correct Group classification list. It should be noted that the largest lithium-ion battery, car manufacturing and ESS manufacturing facility currently in operation is designed with A, B, F-1 and S-1spaces by employing emergency action plans, suppression and detection.

The added activities are:

B Group: Lithium-ion or lithium metal battery testing, research and development

F-1 Group: Lithium-ion batteries; Vehicles powered by lithium-ion or lithium metal batteries

S-1 Group: Lithium-ion or lithium Metal batteries; Vehicle repair garages for vehicles powered by lithium-ion or lithium metal batteries

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The purpose is to place these occupancies in the proper groups, to that effect there is no impact on cost of construction. However, the reason for doing this is a tendency of local officials to default to an H Group designation creating significant increases in construction costs, so this proposal would in many cases provide for a reduction in costs.

G32-21

G33-21

IBC: 304.1, 1004.8 (IFC[BE] 1004.8)

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

2021 International Building Code

Revise as follows:

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

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

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

Reason Statement: Electronic data processing is proposed to be changed to electronic data entry to better align occupancy classifications with actual uses of space. Data entry is work performed in an office, potentially with dense occupant loads (See IBC Sec 1004.8 Concentrated Business Use). Data processing is an essentially automated work occurring in spaces with no occupant load other than information technology maintenance personnel.
In other words, data entry is a business office function; data processing is an industrial process function.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is a clarification with no additional costs.

G33-21

G34-21

IBC: 305.2.2, 305.2.3, 308.5.3, 308.5.4, 310.4.1

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

2021 International Building Code

SECTION 305 EDUCATIONAL GROUP E.

305.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than $2^1/_2$ years of age who receive educational, supervision or *personal care services* for fewer than 24 hours per day.

305.2.1 Within places of religious worship. Rooms and spaces within *places of religious worship* providing such day care during religious functions shall be classified as part of the primary occupancy.

Revise as follows:

305.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy. Such a facility, located within a dwelling unit that is within the scope of the International Residential Code, shall be permitted to be constructed in accordance with this code or the International Residential Code.

Delete without substitution:

~~**305.2.3 Five or fewer children in a dwelling unit.** A facility such as the above within a *dwelling unit* and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.~~

SECTION 308 INSTITUTIONAL GROUP I.

308.5 Institutional Group I-4, day care facilities. Institutional Group I-4 occupancy shall include buildings and structures occupied by more than five persons of any age who receive *custodial care* for fewer than 24 hours per day by persons other than parents or guardians; relatives by blood, marriage or adoption; and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

- Adult day care
- Child day care

308.5.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children $2^1/_2$ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an *exit* door directly to the exterior, shall be classified as Group E.

308.5.2 Within a place of religious worship. Rooms and spaces within *places of religious worship* providing such care during religious functions shall be classified as part of the primary occupancy.

Revise as follows:

308.5.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving *custodial care* shall be classified as part of the primary occupancy. Such a facility, located within a dwelling unit that is within the scope of the International Residential Code, shall be permitted to be constructed in accordance with this code or the International Residential Code.

Delete without substitution:

~~**308.5.4 Five or fewer persons receiving care in a dwelling unit.** A facility such as the above within a *dwelling unit* and having five or fewer persons receiving *custodial care* shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.~~

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

~~**310.4.1**~~ **310.1.1 Care facilities within a dwelling.** Care facilities for five or fewer persons receiving care or a day care that are located within a ~~single-family~~ dwelling unit ~~are permitted to comply~~ that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the *International Residential Code* shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

Reason Statement: The purpose of this change is to remove a technical glitch for where Group R-2 townhouses or apartments may also have a small day care facility. Day care facilities can occur in apartments, townhouses and single family homes. By allowing for 5 or fewer to match the main occupancy, this would still allow for those Group R-3 as a classification in single-family, duplex and Group R-3 townhouses – which is permitted in the current text. This change will also allow for similar facilities in apartments or Group R-2 townhouses. The literal text in 305.2.3 and 308.5.4 says a day care in a dwelling unit make this an R-3 even though the building may be Group R-2.

For facilities that meet the scoping of the IRC (single family, duplex and townhouse), the day care and small care facilities can continue to be constructed under the IRC.

The move of 310.4.1 is because this is no longer just a Group R-3 consideration.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

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

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is basically a coordination item for what facilities can use IRC. This should not change construction requirements.

G34-21

G35-21

IBC: 306.2, 309.1

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

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

Aircraft (manufacturing, not to include repair)
Appliances
Athletic equipment
Automobiles and other motor vehicles
Bakeries
Beverages: over 16-percent alcohol content
Bicycles
Boats
Brooms or brushes
Business machines
Cameras and photo equipment
<u>Cannabis Facilities (extraction portion of the building)</u>
Canvas or similar fabric
Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
Construction and agricultural machinery
Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Energy storage systems (ESS) in dedicated use buildings
Engines (including rebuilding)
Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash and door)
Motion pictures and television filming (without spectators)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Recreational vehicles
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Water/sewer treatment facilities
Wood; distillation
Woodworking (cabinet)

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

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

Reason Statement: Due to widespread legalization of cannabis in state after state, it is reasonable to add these new occpancies in the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The introduction of these two occupancies will not increase or decrease the cost of construction.

G35-21

G36-21

IBC: [F]TABLE 307.1(1), [F]TABLE 307.1(2), [F]307.1.1, [F]TABLE 307.1.1 (New), [F]414.1, [F]415.1; IFC: 5001.1, TABLE 5001.1 (New), TABLE 5003.1.1(1), TABLE 5003.1.1(2)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

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

2021 International Building Code

Revise as follows:

[F] TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, c j, m, n~~, p~~]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds(cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	SeeNote q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fiber[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[~~e~~]		(1,000)			(1,000)			(200)	
Combustible liquid[~~e, i~~]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Cryogenic flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d,e]	NA	NA	1,000[d,e]	NA	NA
	Liquefied			(150)[d,e]	NA		(150)[d,e]	NA		
Flammable liquid[~~e~~, o]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10[d]
	IB and IC			120[d, e]			120[d]			30[d]
Flammable liquid, combination (IA, IB, IC)[~~e~~, o]	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL

	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d,e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d, e]	(5)[d, e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NL = Not Limited; NA = Not Applicable; UD = Unclassified Detonable.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the quantity specified for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 and Chapter 38 of the International Fire Code. ~~The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the International Fire Code. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2 of the International Fire Code.~~

j. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.

l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

n. For ~~storage and display quantities~~ oxidizers, unstable (reactive) materials, and water reactive materials stored or displayed in Group M occupancies ~~and storage quantities~~ or stored in Group S occupancies, see section 414.2.5.1 ~~complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2)~~.

o. For flammable and combustible liquid storage in Group M occupancy wholesale and retail sales uses, see Section 414.2.5.2. ~~Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.~~

p. ~~The following shall not be included in determining the maximum allowable quantities:~~

1. ~~Liquid or gaseous fuel in fuel tanks on vehicles.~~
2. ~~Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the *International Fire Code.*~~
3. ~~Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code.*~~
4. ~~Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code.*~~
5. ~~Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.~~

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.

[F] TABLE 307.1(2)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, c, ~~f,~~ h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e, f]	**Liquid gallons (pounds)[d, e, f]**	**Gas cubic feet at NTP (pounds)[d]**	**Solid pounds[d]**	**Liquid gallons (pounds)[d]**	**Gas cubic feet at NTP (pounds)[d]**	**Solid pounds[d]**	**Liquid gallons (pounds)[d]**
Corrosives	5,000	500	Gaseous 810[e] Liquefied (150)	5,000	500	Gaseous 810[e] Liquefied (150)	1,000	100
Highly Toxic	10	(10)	Gaseous 20[g] Liquefied (4)[g]	10	(10)	Gaseous 20[g] Liquefied (4)[g]	3	(3)
Toxic	500	(500)	Gaseous 810[e] Liquefied (150)[e]	500	(500)	Gaseous 810[e] Liquefied (150)[e]	125	(125)

For SI: 1 cubic foot = 0.028 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the quantity specified for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 and Chapter 38 of the International Fire Code. ~~In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *International Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. For corrosive, highly toxic and toxic materials, stored or displayed in Group M occupancies or stored in Group S occupancies, see Section 414.2.5.1.
~~For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).~~

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *International Fire Code*.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the International Fire Code.

[F] 307.1.1 Occupancy Exemptions~~Uses other than Group H.~~ Storage, use and handling of hazardous materials in accordance with Table 307.1.1 shall not be counted as contributing to Maximum Allowable Quantities and shall not cause classification of an occupancy to be Group H. Such storage, use and handling shall comply with applicable provisions of the International Fire Code.
~~An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.~~

1. ~~Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.~~
2. ~~Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.~~
3. ~~Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.~~
4. ~~Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.~~
5. ~~Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).~~
6. ~~Liquor stores and distributors without bulk storage.~~
7. ~~Refrigeration systems.~~
8. ~~The storage or utilization of materials for agricultural purposes on the premises.~~

9. ~~Stationary storage battery systems installed in accordance with the *International Fire Code*.~~
10. ~~*Corrosive* personal or household products in their original packaging used in retail display.~~
11. ~~Commonly used *corrosive* building materials.~~
12. ~~Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.~~
13. ~~Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.~~
14. ~~The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.~~
15. ~~Stationary fuel cell power systems installed in accordance with the *International Fire Code*.~~
16. ~~Capacitor energy storage systems in accordance with the *International Fire Code*.~~
17. ~~Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.~~
18. ~~Distilling or brewing of beverages conforming to the requirements of the *International Fire Code*.~~
19. ~~The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code*.~~

Add new text as follows:

TABLE 307.1.1
HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.

Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited
		The quantity of hazardous materials in stationary fuel cell power systems is not limited
		The quantity of hazardous materials in capacitor energy storage systems is not limited
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code

a. Exempted materials and conditions listed in this table are required to comply with applicable provisions of the *International Fire Code.*

Revise as follows:

[F] 414.1 General. ~~The provisions of Sections 414.1 through 414.6 shall apply to b~~
Buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of *hazardous materials* shall comply with Sections 414.1 through 414.6.

Exception: Exemptions listed in Table 307.1.1 shall not be required to comply with Section 414.

[F] 415.1 General. Occupancies classified as Group H-1, H-2, H-3, H-4 and H-5 in accordance with Section 307 shall comply with ~~The provisions of~~ Sections 415.1 through 415.11 ~~shall apply to the storage and use of hazardous materials in excess of the maximum allowable quantities per *control area* listed in Section 307.1~~.

2021 International Fire Code

Revise as follows:

5001.1 Scope.
Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, other than those materials and conditions listed in Table 5001.1, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, medicines, foodstuff, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
2. Alcoholic beverages in retail or wholesale sales occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 608).
7. Stationary storage battery systems regulated by Section 1207.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in barrels and casks.

11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.
12. Specific provisions for flammble liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.
14. Storage and display of aerosol products complying with Chapter 51.
15. Storage and use of *flammable* or *combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.
16. *Flammable* or *combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.
17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

Add new text as follows:

TABLE 5001.1
HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.

Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited
		The quantity of hazardous materials in stationary fuel cell power systems is not limited
		The quantity of hazardous materials in capacitor energy storage systems is not limited
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code

a. Exempted materials and conditions listed in this table are required to comply with applicable provisions of the *International Fire Code*.

Revise as follows:

TABLE 5003.1.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, c, j, m, n, ~~p~~]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibers[q]	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled[o]		(1,000)			(1,000)			(200)	
Combustible liquid[c, ~~i~~]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
CryogenicFlammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
CryogenicInert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
CryogenicOxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d, e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Flammable liquid[~~c~~, o]	IA	H-2 or H-3	NA	30[d, e]	NA	NA	30[d]	NA	NA	10d
	IB and IC			120[d, e]			120[d]			30d
Flammable liquid, combination (IA, IB, IC)[o]	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL

Oxidizer	4	H-1	1^{g}	$(1)^{e, g}$	NA	0.25^{g}	$(0.25)^{g}$	NA	0.25^{g}	$(0.25)^{g}$
	3^{k}	H-2 or H-3	$10^{d, e}$	$(10)^{d, e}$		2^{d}	$(2)^{d}$		2^{d}	$(2)^{d}$
	2	H-3	$250^{d, e}$	$(250)^{d, e}$		250^{d}	$(250)^{d}$		50^{d}	$(50)^{d}$
	1	NA	$4{,}000^{e, f}$	$(4{,}000)^{e, f}$		$4{,}000^{f}$	$(4{,}000)^{f}$		$1{,}000^{f}$	$(1{,}000)^{f}$
Oxidizing gas	Gaseous	H-3	NA	NA	$1{,}500^{d,e}$	NA	NA	$1{,}500^{d,e}$	NA	NA
	Liquefied			$(150)^{d, e}$	NA		$(150)^{d, e}$	NA		
Pyrophoric	NA	H-2	$4^{e, g}$	$(4)^{e, g}$	$50^{e, g}$	1^{g}	$(1)^{g}$	$10^{e, g}$	0	0
Unstable (reactive)	4	H-1	$1^{e, g}$	$(1)^{e, g}$	$10^{e, g}$	0.25^{g}	$(0.25)^{g}$	$2^{e, g}$	0.25^{g}	$(0.25)^{g}$
	3	H-1 or H-2	$5^{d, e}$	$(5)^{d, e}$	$50^{d, e}$	1^{d}	$(1)^{d}$	$10^{d, e}$	1^{d}	$(1)^{d}$
	2	H-3	$50^{d, e}$	$(50)^{d, e}$	$750^{d, e}$	50^{d}	$(50)^{d}$	$750^{d, e}$	10^{d}	$(10)^{d}$
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	$5^{d, e}$	$(5)^{d, e}$	NA	5^{d}	$(5)^{d}$	NA	1^{d}	$(1)^{d}$
	2	H-3	$50^{d, e}$	$(50)^{d, e}$		50^{d}	$(50)^{d}$		10^{d}	$(10)^{d}$
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 of the International Building Code and Chapter 38.
~~The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.~~

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

n. For ~~storage and display quantities~~ oxidizers, unstable (reactive) materials, and water reactive materials stored or displayed in Group M occupancies ~~and storage quantities~~ or stored in Group S occupancies , see Section ~~complying with~~ Section 5003.11~~, see Table 5003.11.1~~.

o. For flammable and combustible liquid storage in Group M occupancy wholesale and retail sales uses, see Section 5704.3.6

~~Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.~~

p. ~~The following shall not be included in determining the maximum allowable quantities:~~

1. ~~Liquid or gaseous fuel in fuel tanks on vehicles.~~
2. ~~Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.~~
3. ~~Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.~~
4. ~~Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.~~
5. ~~Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.~~

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.

TABLE 5003.1.1(2)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, ~~c, f~~, h, i]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d, e, f]	Liquid gallons (pounds)[d, e, f]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e] Liquefied (150)	5,000	500	Gaseous 810[e] Liquefied (150)	1,000	100
Highly toxics	10	(10)	Gaseous 20[g] Liquefied (4)[g]	10	(10)	Gaseous 20[g] Liquefied (4)[g]	3	(3)
Toxics	500	(500)	Gaseous 810[e] Liquefied (150)[e]	500	(500)	Gaseous 810[e] Liquefied (150)[e]	125	(125)

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. ~~In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. For corrosive, highly toxic and toxic materials stored or displayed in Group M occupancies or stored in Group S occupancies, See Section 5003.11.1.

~~For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.~~

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

Reason Statement: This proposal attempts to clean up what has become a colossal mess of special exceptions to hazardous materials regulations and Group H occupancy classification and clarify that the special exceptions generally fall into two categories: 1) Outright exclusions to Group H with no quantity limit, or 2) Major increases of MAQ amounts beyond what is provided in the general application MAQ tables. The first group has appeared in a list of exceptions to Group H in IBC Section 307.1.1, and these materials/conditions were generally considered to be exempt from ever being Group H or having to comply with any of the general hazardous materials regulations in the IBC or IFC. The second group clearly gets its own MAQ allowances, but were not specifically exempted from having to follow general hazardous materials safety requirements that are otherwise applicable to quantities that do not exceed MAQ amounts.
Even in the original Group H requirements, and particularly footnotes to the MAQ tables, the "special conditions" were somewhat haphazardly organized, and the situation has only gotten worse over the past three-plus decades.

Trying to pull all of this information together into a more organized presentation was a massive undertaking and in some cases involved interpreting intent of provisions for which application wasn't 100-percent clearly conveyed by existing text. Being involved in this topic for more than 30 years, I feel reasonably confident that my understanding of how the provisions apply is accurate, and certainly, there was no intent to deliberately gore someone's ox. My advice to anyone who is impacted by these portions of the codes is to read the rewrite closely to make sure that there were no unintended consequences from the work that was done. Given the scope of this project and less 3rd party review of the proposal prior to submittal than I would have preferred, it is certainly possible that mistakes may have been made, and in such cases, I will be happy to work on a floor modification for committee consideration to fix these. Note that, for the new Table 307.1.1 and the companion IFC table, I included an extra column showing the original source location for each row/exemption to assist reviewers. It is intended that this information will not be carried into the final version that appears in the code, but may be useful for staff to retain for inclusion in the commentary books.

TABLE 307.1.1

HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption	2021 Source (column to be deleted prior to publication)
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115	Table 307.1(1) note "o"
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited	Section 307.1.1 Item 11
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging	Section 307.1.1 Item 10
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	Table 307.1(2) note "c"
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices are not limited	Section 307.1.1 Item 14
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers are not limited	Section 307.1.1 Item 14
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1	Section 307.1.1 Item 12
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited	Section 307.1.1 Item 6
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited	Section 307.1.1 Item 18
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited	Section 307.1.1 Item 19
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons	Table 307.1(1) note "c"

	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both	Section 307.1.1 Item 4
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited	Section 307.1.1 Item 5
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited	Section 307.1.1 Item 3
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited	Table 307.1(1) note "p" #1 & 2
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited	Table 307.1(1) note "p" #3
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited	Table 307.1(1) note "p" #4
	Fuel oil	The quantity of fuel oil storage complying with Section 603.3.2 of the International Fire Code is not limited	Table 307.1(1) note "I"
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes. Such buildings and areas shall comply with Section 416	Section 307.1.1 Item 1
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code is not limited. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents	Table 307.1(1) note "p" #5
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	Table 307.1(1) note "c"
Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-	Table 307.1(2) note "c"

		miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.	
Any	Agricultural materials	The quantity of agricultural materials stored or utilizated for agricultural purposes on the premises is not limited	Section 307.1.1 Item 8
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited	Section 307.1.1 Item 9
		The quantity of hazardous materials in stationary fuel cell power systems is not limited	Section 307.1.1 Item 15
		The quantity of hazardous materials in capacitor energy storage systems is not limited	Section 307.1.1 Item 16
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited. To qualify for this allowance, such systems shall comply with Section 608 of the International Fire Code and Chapter 11 of the International Mechanical Code	Section 307.1.1 Item 7

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The revision is intended to be a reorganization and edit that should not affect the cost of construction.

G36-21

G37-21

IBC: [F] 307.1.1, 311.2, [F] 414.1.2.1, [F] 414.2.5.3

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

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

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products , ~~or~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory*occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code.*

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

- *Aerosol products*, Levels 2 and 3 , plastic aerosol 2 and plastic aerosol cooking spray products
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone

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

[F] 414.1.2.1 Aerosol products, aerosol cooking spray products, ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products. Level 2 and 3 aerosol products, aerosol cooking spray products , ~~and~~ plastic aerosol 2 and 3 products and plastic aerosol cooking spray products shall be stored and displayed in accordance with the *International Fire Code*. See Section 311.2 and the *International Fire Code* for occupancy group requirements.

[F] 414.2.5.3 Aerosol products, aerosol cooking spray products or plastic aerosol ~~3~~ products. The maximum quantity of *aerosol products*, aerosol cooking spray products or plastic aerosol ~~3~~ products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the *International Fire Code*.

Reason Statement: Full scale fire tests are being conducted to determine the appropriate protection criteria for plastic aerosol 2 products and plastic aerosol cooking spray products.
Where plastic aerosol 3 products should be included in these sections but are not, that is addressed by a separate editorial proposed change. This change is technical in nature and the requirements will be determined upon completion of the fire test program.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal addresses plastic aerosol 2 products and plastic aerosol cooking spray products which were not previously addressed by the Code.

G37-21

G38-21

IBC: [F] 307.1.1

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

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

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory*occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. ~~Distilling or brewing of beverages conforming to the requirements of the *International Fire Code*.~~

19. 18. The storage of beer~~, distilled spirits~~ and wines in barrels and casks conforming to the requirements of the *International Fire Code.*

Reason Statement: These two items were added to the 2021 IFC and IBC by the Fire Code Committee. We believe that the classification of occupancies should have been heard by the IBC General Committee. Distilleries can be a very hazardous occupancy depending on the size of the facility. We would agree that a small craft distillery may not be a major hazard. However, the change did not address that. It just lumped all these types of facilities in the same group. Therefore, a major manufacturer of distilled spirits with hundreds of thousands of gallons of flammable liquids would not be classified as a Group H occupancy. There have been fires at these facilities that have had a major impact on the local community and the owners. We believe that facilities that have amounts of flammable liquids in excess of the maximum allowable quantities.

Cost Impact: The code change proposal will increase the cost of construction
A facility classified as a Group H occupancy has higher levels of life-safety provisions that will increase the cost of construction when not classified as a Group F-1 & S-1 occupancies.

G39-21

IBC: [F] 307.1.1

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

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

2021 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles *hazardous materials* as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for *aerosol product* storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.
16. Capacitor energy storage systems in accordance with the *International Fire Code*.
17. Group B *higher education laboratory* occupancies complying with Section 428 and Chapter 38 of the International Fire Code.
18. Distilling or brewing of beverages conforming to the requirements of the *International Fire Code.*
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the *International Fire Code.*
20. <u>The storage, use, and handling of explosives and explosive materials by Federal law enforcement agencies acting in their official capacities in Group B occupancies complying with Section 5604 of the International Fire Code.</u>

Reason Statement: Several Federal Law Enforcement Agencies by the nature of their mission have a need to possess, store, use, and handle explosives and explosive materials at or near their base of operation. For example, Federal Law Enforcement Agencies utilizing canine teams to provide explosive detection have a need to possess, store and use explosive canine training aids and Federal Law Enforcement Agencies that confiscate explosive materials during their daily activities also need storage areas near their base operations to store these types of explosive materials. However, following the prescriptive storage requirements in Chapter 56 for explosive materials would prohibit the storage of these types of explosive materials within spaced leased by the Federal Government in commercial office buildings as well as in Federally-owned office buildings and in some cases prohibit such storage on Federally-owned property. This proposed code change attempts to address this issue by including an additional exception that would permit Federal Law Enforcement Agencies acting in their official capacities.

Bibliography: N/A

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

This could reduce the additional protection requirements in the federal law enforcement office. Application is limited.

G39-21

G40-21

IBC: [F] 307.3.1

Proponents: William Koffel, representing Self (wkoffel@koffel.com)

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

2021 International Building Code

Revise as follows:

[F] 307.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing *explosive* materials shall be classified as follows:

1. Division 1.3 *explosive* materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass *explosion* hazard shall be allowed in H-2 occupancies.
2. <u>Division 1.4 explosive materials that are used and maintained in a form that only pose a minor explosion hazard shall be allowed in H-3 occupancies.</u>
23. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 *explosive* under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

Reason Statement: The FCAC Working Group 6.1 on Hazardous Materials discussed that Table 307.1(1) identified the occupancy for Division 1.4 explosive materials as Group H-3. However the language within Section 307.3 and the exceptions in Section 307.3.1 do not clearly link to that occupancy classification.
The IFC Commentary states that:
There are certain explosive materials that pose a hazard level less than that anticipated for a Group H-1 occupancy. A Group H-2 classification is permitted for Division 1.3 explosive materials used or maintained under conditions where the hazard level will not rise from that of a mass fire hazard to a mass explosion hazard. A Group H-3 occupancy classification is permitted for packaged and unpackaged articles not regulated as Division 1.4 explosives by the Bureau of Alcohol, Tobacco and Firearms, as well as unpackaged articles used in process operations, provided there is no concern regarding the propagation of a detonation or deflagration between the articles during process operations.

The proposed Item 2 is intended to correlate Table 307.1(1) with this section consistent with guidance provided in the IFC Commentary.

It should be noted that while Koffel Associates provides consulting services to the American Pyrotechnics Association, the proposal was not submitted on their behalf. The proposal was prepared based upon a commitment made to the Working Group to proposal a solution to the conflict.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Whereas the proposal clarifies the intent of the Code, there should be no impact on the cost of construction.

G40-21

G41-21

IBC: [F] 307.4, [F] 307.5

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

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

2021 International Building Code

Revise as follows:

[F] 307.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.
Cryogenic fluids, flammable.
Category 1A*Flammable gases.*
Category 1B *Flammable gases* having a burning velocity greater than 3.9 inches per second (10 cm/s).
Organic peroxides, Class I.
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).
*Pyrophoric*liquids, solids and gases, nondetonable.
Unstable (reactive) materials, Class 3, nondetonable.
Water-reactive materials, Class 3.

[F] 307.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less
Combustible fibers, other than densely packed *baled cotton*, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or *explosion* hazard based on information prepared in accordance with Section 414.1.3
Consumer *fireworks*, 1.4G (Class C, Common)
Cryogenic fluids, oxidizing
Category 1B *flammable gases* having a burning velocity of 3.9 inches per second (10 cm/s) or less
Flammable solids
Organic peroxides, Class II and III
Oxidizers, Class 2
Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less
Oxidizing gases
Unstable (reactive) materials, Class 2
Water-reactive materials, Class 2

Reason Statement: This change coordinates the classification of high hazard with the change in definition to “flammable gas.” Category 1A flammable gases have an explosive component in that their deflagration index is extremely low. By comparison, Category 1B flammable gases with a burning velocity of 3.9 in/s or less have a very high deflagration index. Thus, there is a significant difference in the hazard level between the two flammable gas categories.
The more appropriate classification for a Category 1B flammable gas with a burning velocity of 3.9 in/s or less appears to be Use Group H-3. This classification can be supported by a comparison of level of hazard identified in the code change to the MAQ table for flammable gas. The minimum ignition energy varies by as much at 58,000 times. The heat of combustion is between 6 and 19 percent of these Category 1B flammable gases. Thus, Use Group H-3 is the proper classification for Category 1B flammable gas with a burning velocity of 3.9 in/s or less.

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

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

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

Cost Impact: The code change proposal will decrease the cost of construction
This code change reduces the cost of construction. By modifying the Use Group for Category 1B flammable gas, the construction costs are also lowered. The construction costs for Category 1A flammable gas remain unchanged, neither increased nor decreased in the cost of construction.

G41-21

G42-21

IBC: 308.2.4, 308.3.2, 310.4.1

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

2021 International Building Code

SECTION 308 INSTITUTIONAL GROUP I.

Revise as follows:

308.2.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving *custodial care* shall be classified as Group R-2 or Group R-3 based on the primary occupancy of the building. ~~or shall comply~~ Such a facility, located within a dwelling unit that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the International Residential Code shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

308.3.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving *medical care* shall be classified as Group R-2 or Group R-3 , based on the primary occupancy of the building. ~~or shall comply~~ Such a facility, located within a dwelling unit that is within the scope of the I*nternational Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the *International Residential Code* shall be protected by an automatic sprinkler system ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

~~**310.4.1**~~ **310.1.1 Care facilities within a dwelling.** Care facilities for five or fewer persons receiving medical care or custodial care that are located within a ~~single-family~~ dwelling unit ~~are permitted to comply~~ that is within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or with the *International Residential Code*. ~~provided~~ Facilities constructed using the International Residential Code shall be protected by an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

Reason Statement: The intent of this proposal is to clarify the allowance for when a care facility fits into the residential requirements in the IBC or IRC.
Sticking with the current intent in the codes, these facilities should be permitted in a home environment – be it detached single family, townhouse or apartment – thus the reference to Group R-3 and R-2. The IRC reference allows for the facility to use IRC if the dwelling unit it is in is scoped to the IRC.

The relocation of Section 310.4.1 is because this is no longer just a Group R-3 consideration.

This proposal does not change what facilities can currently be constructed under the IRC, however, in the past there has been arguments that these facilities should not be permitted under the IRC. A facility of 5 or fewer persons could be in a detached dwelling, a townhouse or an apartment building. The Fair Housing Act does not allow for family to be defined by blood or marriage. Multiple court cases have confirmed that people have the right to live in a home environment instead of an institutional facility if they so choose. If this is a business, this small group home is most likely operating as a family; and would fall below the licensure rules of most states. However, in most cases, this will be couple with foster children or someone taking care of a friend who needs assistance - not a business. The IBC does not typically go into issues on licensure or who is paying what – we look at the use of the space.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

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

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

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

G42-21

G43-21

IBC: 310.2, 310.3, 310.4, 310.4.2

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

2021 International Building Code

SECTION 310 RESIDENTIAL GROUP R.

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* . Group R occupancies not constructed in accordance with the *International Residential Code* as permited by Sections 310.4.1 and 310.4.2 shall comply with Section 420.

Revise as follows:

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

- *Boarding houses* (*transient*) with more than 10 occupants
- *Congregate living facilities* (*transient*) with more than 10 occupants
- Hotels (*transient*)
- Motels (*transient*)
- Lodging houses with more than 5 guest rooms

310.3 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- *Congregate living facilities* (nontransient) with more than 16 occupants
    - *Boarding houses* (*nontransient*)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- Hotels (nontransient) with more than 10 occupants
- *Live/work units*
- Motels (nontransient) with more than 10 occupants
- Vacation timeshare properties

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* ~~(*transient*)~~ with five or fewer *guest rooms* ~~and 10 or fewer occupants~~
- Hotels (nontransient) with 10 or fewer occupants
- Motels (nontransient) with 10 or fewer occupants

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

or Section P2904 of the International Residential Code.

Revise as follows:

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

Reason Statement: The intent of this proposal is to separate large and small lodging houses and non-transient hotel/motel.
The definition for lodging house does not limit the size of the facility. To be consistent with what can use the IRC, the text in IBC cannot use the standard occupant load limitations. In addition, 5 guest rooms and a proprietors family is most likely to be more than 10 occupants, which is currently in the IBC. In addition, the whole lodging house is not transient.

For small non-transient hotels and motels, the maximum occupant load of 10 is consistent with the current limitations for transient boarding houses.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of the divisions between large and small lodging houses and does not add any requirements for these facilities.

G43-21

G44-21 Part I

PART I - IBC: 310.2, 420.2, 420.3, 716.2.6.1, 1010.1.2, 1103.2.11, E104.2.1; (IFC[BE] 1010.1.2)
PART II - IFC: 308.4.1, 403.9.1.1, 907.2.8.1, 907.2.8.2, 907.2.11.1, TABLE 907.5.2.3.2, 1103.7.5.1, 1103.7.5.1.1, 1103.7.5.2, 1103.7.5.2.1, 1104.5; (IBC[F] 907.2.8.1, 907.2.8.2, TABLE 907.5.2.3.2, 907.2.11.1); IPMC: [F] 704.6.1.1; IBC: [F] 403.4.7
PART III - IPC: TABLE 403.1, 606.2;
PART IV- IZC: SECTION 202, TABLE 801.2.1

Proponents: Dan Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

THIS IS A 4 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. PART IV WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Revise as follows:

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

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

420.2 Separation walls. Walls separating *dwelling units* in the same building, walls separating *sleeping units* in the same building , walls separating *dwelling units* from sleeping units in the same building, and walls separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *fire partitions* in accordance with Section 708.

420.3 Horizontal separation. Floor assemblies separating *dwelling units* in the same buildings, floor assemblies separating *sleeping units* in the same building , floor assemblies separating *dwelling units* from sleeping units in the same building, and floor assemblies separating dwelling or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *horizontal assemblies* in accordance with Section 711.

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

Exceptions:

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

1010.1.2 Egress door types. Egress doors shall be of the side-hinged swinging door, pivoted door, or *balanced door* types.

Exceptions:

1. *Private garages*, office areas, factory and storage areas with an *occupant load* of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single *dwelling unit* in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1010.3.1.
6. In other than Group H occupancies, special purpose horizontal sliding, accordion or folding door assemblies complying with Section 1010.3.3.
7. *Power-operated* doors in accordance with Section 1010.3.2.
8. Doors serving a bathroom within an individual *dwelling unit* or *sleeping unit* in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a *means of egress* from spaces with an *occupant load* of 10 or less.

1103.2.11 Residential Group R-1. Buildings of Group R-1 containing not more than five *dwelling units* and *sleeping units* in aggregate for rent or hire that are also occupied as the residence of the proprietor are not required to comply with this chapter.

E104.2.1 Transient lodging. In *transient lodging* facilities, *dwelliing units* or *sleeping units* with accessible communication features shall be provided in accordance with Table E104.2.1. Units required to comply with Table E104.2.1 shall be dispersed among the various classes of units.

G44-21 Part I

G44-21 Part II

PART II - IFC: 308.4.1, 403.9.1.1, 907.2.8.1, 907.2.8.2, 907.2.11.1, TABLE 907.5.2.3.2, 1103.7.5.1, 1103.7.5.1.1, 1103.7.5.2, 1103.7.5.2.1, 1104.5; (IBC[F] 907.2.8.1, 907.2.8.2, TABLE 907.5.2.3.2, 907.2.11.1); IPMC: [F] 704.6.1.1; IBC: [F] 403.4.7

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Fire Code

Revise as follows:

308.4.1 Group R-2 dormitories. Candles, incense and similar open-flame-producing items shall not be allowed in *dwelling units* or *sleeping units* in Group R-2 dormitory occupancies.

403.9.1.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel *dwelling unit* or *sleeping unit*.

907.2.8.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual *dwelling units*, *sleeping units*, and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour *fire partitions* and each individual *dwelling unit* and *sleeping unit* has an *exit* directly to a *public way*, *egress court* or yard.
2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
   - 2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 2.2. The notification appliances will activate upon sprinkler water flow.
   - 2.3. Not fewer than one manual fire alarm box is installed at an *approved* location.

907.2.8.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior *corridors* serving *dwelling units* or *sleeping units*.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *dwelling units* or *sleeping units* and where each *dwelling unit* or *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

907.2.11.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the *means of egress* from the sleeping area to the door leading from the *dwelling unit* or *sleeping unit*.
3. In each story within the *dwelling unit* or *sleeping unit*, including *basements*. For *dwelling units* or *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

TABLE 907.5.2.3.2
VISIBLE ALARMS

AGGREGATE NUMBER OF DWELLING UNITS AND SLEEPING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

1103.7.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels more than one story in height or with more than 20 *dwelling units* or *sleeping units* in aggregate.

Exceptions:

1. A manual fire alarm system is not required in buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire-resistance-rated* construction and each *sleeping unit* has direct access to a *public way*, *egress court* or yard.
2. A manual fire alarm system is not required in buildings not more than three stories in height with not more than 20 *dwelling units or sleeping units* in aggregate and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Manual fire alarm boxes are not required throughout the building where the following conditions are met:

    3.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

    3.2. The notification appliances will activate upon sprinkler water flow.

    3.3. Not less than one manual fire alarm box is installed at an *approved* location.

1103.7.5.1.1 Group R-1 hotel and motel automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels throughout all interior *corridors* serving sleeping rooms not equipped with an *approved*, supervised *automatic sprinkler system* installed in accordance with Section 903.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *dwelling units* or *sleeping units* and where each *dwelling unit* or *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

1103.7.5.2 Group R-1 boarding and rooming houses manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire-resistance-rated* construction and each *dwelling unit* or *sleeping unit* has direct access to a *public way*, *egress court* or yard.

1103.7.5.2.1 Group R-1 boarding and rooming houses automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses throughout all interior *corridors* serving *dwelling units* or *sleeping units* not equipped with an *approved*, supervised sprinkler system installed in accordance with Section 903.

Exception: Buildings equipped with single-station smoke alarms meeting or exceeding the requirements of Section 907.2.11.1 and where the fire alarm system includes not less than one manual fire alarm box per floor arranged to initiate the alarm.

1104.5 Illumination emergency power. Where *means of egress* illumination is provided, the power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more *means of egress*:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an *occupant load* of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a *level of exit discharge* serving the occupants or buildings with 1,000 or more total occupants.
3. Group E in interior *exit access* and *exit stairways* and *ramps*, *corridors*, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours and that are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. ~~Group R-1.~~

   ~~**Exception:** Where each *sleeping unit* has direct access to the outside of the building at grade.~~

8. Group<u>s R-1 and</u> R-2.

   Exception: Where each *dwelling unit* or *sleeping unit* has direct access to the outside of the building at grade.

2021 International Property Maintenance Code

Revise as follows:

[F] 704.6.1.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the <u>*dwelling unit* or</u> *sleeping unit*.
3. In each story within the <u>*dwelling unit* or</u> *sleeping unit*, including *basements*. For <u>*dwelling units* or</u> *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

2021 International Building Code

Revise as follows:

[F] 403.4.7 Smoke removal. To facilitate smoke removal in post-fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical *ventilation* for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50-foot (15 240 mm) intervals. The area of operable windows or panels shall be not less than 40 square feet (3.7 m^2) per 50 linear feet (15 240 mm) of perimeter.

   Exceptions:

   1. In Group R-1 occupancies, each <u>*dwelling unit*,</u> *sleeping unit* or suite having an *exterior wall* shall be permitted to be provided with 2 square feet (0.19 m^2) of venting area in lieu of the area specified in Item 1.
   2. Windows shall be permitted to be fixed provided that glazing can be cleared by fire fighters.

2. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other *approved* design that will produce equivalent results.

G44-21 Part III

PART III - IPC: TABLE 403.1, 606.2;

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

Portions of table not shown remain unchanged.

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2) MALE	WATER CLOSETS FEMALE	LAVATORIES MALE	LAVATORIES FEMALE	BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
7	Residential	Hotels, motels, boarding houses (transient)	1 per *dwelling* or sleeping unit		1 per *dwelling* or sleeping unit		1 per *dwelling* or sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling or *sleeping* unit		1 per dwelling or *sleeping* unit		1 per dwelling or *sleeping* unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

606.2 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

1. On the fixture supply to each plumbing fixture other than bathtubs and showers in one- and two-family residential *occupancies*, and other than in individual dwelling or sleeping units that are provided with unit shutoff valves in hotels, motels, boarding houses and similar *occupancies*.
2. On the water supply pipe to each sillcock.
3. On the water supply pipe to each appliance or mechanical equipment.

G44-21 Part III

G44-21 Part IV

PART IV- IZC: SECTION 202, TABLE 801.2.1

Proponents: Daniel Willham, Fairfax County, representing Fairfax County (daniel.willham@fairfaxcounty.gov)

2021 International Zoning Code

Revise as follows:

MOTEL, HOTEL. Any building containing six or more *dwelling units* or *sleeping* units in aggregate intended or designed to be used, or that are used, rented or hired out to be occupied, or that are occupied for sleeping purposes by guests.

TABLE 801.2.1
OFF-STREET PARKING SCHEDULE

USE	NUMBER OF PARKING SPACES REQUIRED
Assembly	1 per 300 gross square feet
Dwelling unit	2 per dwelling unit
Health club	1 per 100 gross square feet
Hotel/motel	1 per dwelling or sleeping unit plus1 per 500 square feet of common area
Industry	1 per 500 square feet
Medical office	1 per 200 gross square feet
Office	1 per 300 gross square feet
Restaurant	1 per 100 gross square feet
Retail	1 per 200 gross square feet
School	1 per 3.5 seats in assembly rooms plus1 per faculty member
Warehouse	1 per 500 gross square feet

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

Reason Statement: This change corrects discrepancies inadvertently created by past code changes. The description for R-1 occupancies used to only read "R-1 Residential occupancies where the occupants are primarily transient in nature ..." It did not mention sleeping units. The definition for *sleeping units* was added to the code to coordinate with the Fair Housing Act Guidelines (see code change E70-00) and did not involve the descriptions for residential occupancies in Chapter 3. Sleeping units was added to the descriptions of R-1 (2006 IBC) and R-2 (2003 IBC), in changes that do not appear in any code change proposal; these changes are also not marked as changes by bars in the margins. They appear to possibly have been made by the code correlation committee. However, no correction was made to the description of R-1, which, like R-2 occupancies, can also include both dwelling and sleeping units. This has left an apparent gap in the code for transient residential occupancies with dwelling units. This change resolves that by adding "or more than two dwelling units" to the description of R-1. Similar to the wording for the description for R-2, " or more than two dwelling units" avoids including R-3 residential occupancies and one- and two-family dwellings regulated under the IRC. This change also coordinates the references to sleeping units throughout the codes for R-1 occupancies to also include dwelling units. While doing this, a couple of instances of dwelling units for R-2 (without the mention of sleeping units) were found and also corrected to include sleeping units to coordinate with the description of R-2 occupancies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification and coordination of the code which will not affect construction cost.

G44-21 Part IV

G45-21

IBC: 310.3, 310.4

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

2021 International Building Code

Revise as follows:

310.3 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- *Congregate living facilities* (nontransient) with more than 16 occupants
    - *Boarding houses* (*nontransient*)
    - Convents
    - *Dormitories*
    - Fire station living quarters
    - Fraternities and sororities
    - Monasteries
- Hotels (nontransient)
- *Live/work units*
- Motels (nontransient)
- Vacation timeshare properties

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fire station living quarters
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* (*transient*) with five or fewer *guest rooms* and 10 or fewer occupants

Reason Statement: Fire stations are often mixed use facilities, and sometime include living quarters. There is the question if this is a single family residence, Group R-3, regardless of the number of fireman using the living quarters. This proposal will clarify how these spaces should be classified.

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

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

This is a clarification of the correct classification for fire stations.

G45-21

G46-21

IBC: 310.4, 310.4.2

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

2021 International Building Code

[BG] GUESTROOM. A room used or intended to be used by one or more guests for living or sleeping purposes.

[BG] LODGING HOUSE. A one-family dwelling where one or more occupants are primarily permanent in nature and rent is paid for guest rooms.

SECTION 310 RESIDENTIAL GROUP R.

Revise as follows:

310.4 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two *dwelling units*
- Care facilities that provide accommodations for five or fewer persons receiving care
- *Congregate living facilities* (nontransient) with 16 or fewer occupants
    - *Boarding houses* (nontransient)
    - Convents
    - *Dormitories*
    - Fraternities and sororities
    - Monasteries
- *Congregate living facilities* (*transient*) with 10 or fewer occupants
    - *Boarding houses* (*transient*)
- *Lodging houses* ~~(*transient*)~~ with five or fewer *guest rooms* ~~and 10 or fewer occupants~~

310.4.2 Lodging houses. Owner-occupied *lodging houses* with five or fewer *guest rooms* ~~and 10 or fewer total occupants~~ shall be permitted to be constructed in accordance with <u>this code or</u> the *International Residential Code*<u>.</u>~~, provided~~ <u>Facilities constructed using the *International Residential Code* shall be protected by</u> that an *automatic sprinkler system* ~~is~~ installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code.*

Reason Statement: The intent of this change is to coordinate with IRC scoping for lodging houses. G40-12 added the defined term 'lodging house' and 'guestroom' and Section 310.4.2 for coordination with the scoping in the 2012 IRC. G40-15 added 'transient' and '10 or fewer occupants'. Since the owner or proprietor lives in the lodging house (see the definition), this is not 'transient', so that language should be deleted in Section 310.4. The reason given for adding "and 10 or fewer occupants" was consistency with the occupancy load for transient boarding houses. However, this does not take into consideration that owner's family as well as the 10 transient occupants. Occupant load is not addressed in the IRC, so this does not match the IRC Scoping in Section 101.2 Exception 2.

If the committee feels that 5 or fewer guestrooms is not a sufficient limitation, a maximum occupant load or either 10 transient occupants, or 16 total occupants could be considered.

The last change to Section 310.4.2 is to allow for a small bed-n-breakfast style hotel to be constructed in accordance with IBC if they so choose.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.

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

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirements, not a change to construction requirements. Removal of the 10 occupant load from Lodging house, might allow for some small additional B-n-B facilities to be constructed under the IRC.

G47-21

IBC: 3105.3, D105.1, CHAPTER 35 SFM (New)

Proponents: Paul Armstrong, representing IFAI

2021 International Building Code

Revise as follows:

3105.3 Awnings and canopy materials. *Awnings* and *canopies* shall be provided with an *approved* covering that complies with one of the following:

1. The fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.
2. Has a *flame spread index* not greater than 25 when tested in accordance with ASTM E84 or UL 723.
3. Meets all of the following criteria when tested in accordance with NFPA 286:
    - 3.1. During the 40 kW exposure, flames shall not spread to the ceiling.
    - 3.2. Flashover, as defined in NFPA 286, shall not occur.
    - 3.3. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
    - 3.4. The peak heat release rate throughout the test shall not exceed 800 kW.
4. All fabric shall be flame -resistant in accordance with the provisions set forth in SFM 19 CCR 1237. Tops and sidewalls shall be made from either fabric that has been treated with an approved exterior chemical process by an approved applicator, or from approved inherently flame-resistant fabric.

Exception: The fire propagation performance and *flame spread index* requirements shall not apply to awnings installed on detached one- and two-family dwellings.

SECTION D105 EXCEPTIONS TO RESTRICTIONS IN FIRE DISTRICT.

Revise as follows:

D105.1 General. The preceding provisions of this appendix shall not apply in the following instances:

1. Temporary buildings used in connection with duly authorized construction.
2. A *private garage* used exclusively as such, not more than one *story* in height, nor more than 650 square feet (60 m^2) in area, located on the same lot with a *dwelling*.
3. Fences not over 8 feet (2438 mm) high.
4. Coal tipples, material bins and trestles of Type IV construction.
5. Water tanks and cooling towers conforming to Sections 1510.3 and 1510.4.
6. *Greenhouses* less than 15 feet (4572 mm) high.
7. Porches on dwellings not over one *story* in height, and not over 10 feet (3048 mm) wide from the face of the building, provided that such porch does not come within 5 feet (1524 mm) of any property line.
8. Sheds open on a long side not over 15 feet (4572 mm) high and 500 square feet (46 m^2) in area.
9. One- and two-family *dwellings* where of a type of construction not permitted in the fire district can be extended 25 percent of the floor area existing at the time of inclusion in the fire district by any type of construction permitted by this code.
10. Wood decks less than 600 square feet (56 m^2) where constructed of 2-inch (51 mm) nominal wood, pressure treated for exterior use.
11. Wood *veneers* on *exterior walls* conforming to Section 1404.5.
12. Exterior plastic *veneer* complying with Section 2605.2 where installed on *exterior walls* required to have a *fire-resistance rating* not less than 1 hour, provided that the exterior plastic *veneer* does not exhibit sustained flaming as defined in NFPA 268.
13. Awnings complying with Section 3105.

Add new standard(s) as follows:

SFM

California State Fire Marshal
1131 S Street
Sacramento CA 95814

USA

SFM 19 CCR 1237 Awning Fabric Flame Testing.

Staff Analysis: A review of the standard proposed for inclusion in the code, SFM 19 CCR 1237, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2021.

Reason Statement: This code change proposal is really in two parts. In the first part, the Industrial Fabric Association International membership has found that most of it's members use either NFPA 701 or the California State Fire Marshal's provisions for flame-resistance testing for awning materials. While many of the new fabric materials are inherently flame-resistance, it is time to recognize those materials that have already been tested and approved by the California State Fire Marshal's office.
The second part is to clarify the application of Appendix D Fire Districts in regards to awnings vs canopies. The provisions of Appendix D are intended to be applied to Canopies only in Section D102.2.8. Awnings have been included in many jurisdictions and this proposal will clarify that awnings that comply with IBC Section 3105 are allowed in identified Fire Districts. There is no change intended in the current application of the provisions of Appendix D.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal recognizes existing practice as such would not be an increase or decrease in cost of construction.

G47-21

G48-21

IBC: 311.2

Proponents: William Koffel, representing Household and Commercial Products Association (wkoffel@koffel.com)

2021 International Building Code

Revise as follows:

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

- *Aerosol products*, Levels 2 and 3 , aerosol cooking spray, plastic aerosol 3 (PA3)
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

Reason Statement: Adding aerosol cooking spray and plastic aerosols 3 (PA3) to the list for Group S-1 is consistent with the requirements in the International Fire Code and provides a more complete list. Without these being identified in the list, one is left to wonder what is the appropriate occupancy classification.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding these to the list does not change how the IBC or IFC is applied to these storage facilities.

G48-21

G49-21

IBC: 402.1

Proponents: Jeff Manzetti, representing Self-Represented (jeffmanzetti@mac.com)

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.1 Applicability. The provisions of this section shall apply to buildings or structures defined herein as *covered or open mall buildings* not exceeding three floor levels at any point nor more than three *stories above grade plane*. Except as specifically required by this section, *covered and open mall buildings* shall meet applicable provisions of this code.

Exceptions:

1. Foyers and lobbies of Group B, R-1 and R-2 occupancies are not required to comply with this section.
2. <u>Airport passenger terminals of Group A occupancies are not required to comply with this section.</u>
2.3. Buildings need not comply with the provisions of this section where they totally comply with other applicable provisions of this code.

Reason Statement: Airport Passenger Terminals are unique buildings with:

1. A high level of security,
2. Extreme variations of the number of occupants,
3. Numerous and large equipment moving around the buildings at arbitrary and various times.
4. High rate of risks.

Due to this unique building type that includes:

1. Egress: (402.8)

- Occupants to go through security and then are physically confined to a sterile (non-threating to aircraft) area.
- Occupants access to exits from the secured sterile area is unfamiliar. (Egress out of the Terminal Concourse is never the same way the occupant entered the secure concourse through security)
- The egress destination is usually very unfamiliar. (Discharge from the secure concourse is usually onto a dangerous aircraft filled apron ramp.)

2. Open Space (402.2) (402.1.1)

- Large Aircraft, Ground Service equipment, and Passenger Boarding Bridges occupy the majority of the terminal concourse perimeter.

3. Fire Truck/Department access: (402.7.5)

- Aircraft non-movement and movement areas are fenced in and do not readily allow quick and easy access to the building.

4. Tenants are atypical (402.3) (402.4.2) (402.4.2.1)

- Unlike mall tenants that have a modular and repetitive layout of tenants, Airport tenants are scattered in many different areas based on the service provided. These include:
  - Car rentals
  - Food service
  - Retail Service
  - Airlines (Gates, and Ground Support)
- No Anchor Tenant

They (Airport Passenger Terminal Buildings) should not be compared, because of the few similarities, with the primary building type intended for this section. Airport Designers use this section to gain access to the unlimited area while using the lesser type of construction all while claiming that other provisions are not intended for their project specific condition. The Commentary has introduced designers to the concept of using this section, and as such provide the designer down a path to cherry pick because there will never be an airport that could fully operate while complying with the full requirements of the section. This is mostly due to the Commentary citing that "airports passenger terminals,... have also been constructed in accordance with this section." setting a precedent for designers to argue the use of the section while not providing a fully compliant design. Airports will:

- Never have (402.1.1) a perimeter line,
- Never have adequate (402.2) Open space, aircraft are always in a gate position.
- Rarely have an updated current (402.3) lease plan on file with the fire and building departments
- Rarely update the fire-resistance to the leased space
- Rarely update the fire-suppression to the leased space
- Never have a Anchor building

There are too many grey areas for Airports as they currently function that they can never fully meet the entirety of the 402 section for it to be an allowable use.

Bibliography: Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 25, Airport Passenger Terminal Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2010

Transportation Research Board, Airport Cooperative Research Program (ACRP) Report 96, Apron Planning and Design Guidebook, Washington DC, Cooperative Research Program, 2013

US Department of Transportation Federal Aviation Administration, AC 150/5360-13A, Planning and Design Guidelines for Airport Terminal Facilities, dated July 13, 2018

Cost Impact: The code change proposal will increase the cost of construction
Type of Construction is the Issue: Section 402 allows Unlimited area for Type IIB construction. Which is cheaper than Standard Area/Use/Type of Construction (Chapter 5 & 6) which would be equivalent to Unlimited area of Type I construction. Currently, this loophole for Airports causes a decrease in construction cost, at the price of safety. By getting rid of the loophole Airport terminals buildings would completely comply with the standard (Non-Special Detailed Requirements Based on Occupancy and Use) and applicable provisions of the code, which are naturally going to be safer buildings with a higher type of construction.

When compared to the loophole, this code change proposal is a cost increase.

When compared to using Chapter 3, 5, and 6 normally for Airports there is no change.

G49-21

G50-21

IBC: [F] 402.5; IFC: 914.2.1

Proponents: Alex Miear, representing Code Consultants, Inc. (CCI) (alexm@codeconsultants.com)

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

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

[F] 402.5 Automatic sprinkler system. *Covered* and *open mall buildings* and buildings connected shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, which shall comply with all of the following:

1. The *automatic sprinkler system* shall be complete and operative throughout occupied space in the *mall building* prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with *approved* alternative protection.
2. Sprinkler protection for the *mall* of a *covered mall building* shall be independent from that provided for tenant spaces or *anchor buildings*.
3. Sprinkler protection for the tenant spaces of an *open mall building* shall be independent from that provided for *anchor buildings*.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an *open mall*.
5. Where tenant spaces are supplied by the mall ~~same~~ system, they shall be independently controlled.

   Exception: An *automatic sprinkler system* shall not be required in spaces or areas of *open parking garages* separated from the covered or *open mall building* in accordance with Section 402.4.2.3 and constructed in accordance with Section 406.5.

2021 International Fire Code

Revise as follows:

914.2.1 Automatic sprinkler system. Covered and open mall buildings and buildings connected shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, which shall comply with the all of the following:

1. The *automatic sprinkler system* shall be complete and operative throughout occupied space in the mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with *approved* alternative protection.
2. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces or anchor buildings.
3. Sprinkler protection for the tenant spaces of an open mall building shall be independent from that provided for anchor buildings.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an open mall.
5. Where tenant spaces are supplied by the ~~same~~ mall system, they shall be independently controlled.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of open parking garages separated from the covered or open mall in accordance with Section 402.4.2.3 of the International Building Code and constructed in accordance with Section 406.5 of the International Building Code.

Reason Statement: Prior to the 2012 IBC (where the code was expanded to provide more distinction between the covered mall building requirements and the open mall building requirements), the mall sprinkler requirements read as follows:

-402.9 (2) - Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.
Item 5 in the 2018 IBC (which originated in the 2012 IBC) is the last sentence of Item 2 in the 2009 IBC.

The 2012 Code change resulted in this sentence becoming its own line item, but when it’s not coupled with the preceding sentence in Item 2 of the 2009 IBC, the meaning of the requirement changes (i.e. Item 5 read on its own could be interpreted to require individual control valves for tenants supplied by a common system). However, this was never the intent of this requirement.

As is evident by the 2009 IBC language, the intent of the requirement is to mandate tenant control valves if the tenant sprinkler system supplied by the mall system. Further, the 2009 IBC / 2012 IBC code change documentation does not present this as a technical change (tenant control valves for tenants supplied by a common tenant system is not mentioned anywhere in the code change reasoning for the change). The 2012 IBC Item 5 is not identified with a black line in the margin, which indicates this change was intended to simply be a formatting change and not a technical change to the 2009 IBC requirements. In summary, when Item 5 was formatted in the 2012 IBC as an independent statement, the logic of the 2009 IBC statement was lost.

Replacing the word “same” with “mall” in Item 5 corrects the inadvertent technical change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not alter the technical requirements and does not impact the cost of construction.

G50-21

G51-21

IBC: 402.8.2.2

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

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

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.8.2.2 OLF range. The*occupant load* factor (*OLF*) ~~is not required to be less than 30 and shall not exceed~~ shall be 50 gross.

Reason Statement: Since the inception of the covered mall provisions in the legacy codes, and through the 2012 edition of the IBC the formula the Occupant Load Factor or OLF used to design the means of egress system for a covered mall building was "not required to be less than 30 and shall not exceed 50."
This limitation was intentionally consistent with recognized occupant load factors in the codes for mercantile occupancies. Each of the legacy codes, and through the 2012 IBC the occupant load factors for mercantile occupancies were:

30 Basements and grade floor areas
60 Areas on other floors

300 Storage, stock and shipping areas

Recognizing that the utilization of retail spaces has significantly changed, Code Change E18-12 revised the occupant load factors for the shopping areas to be 60 sf/person, regardless of the location in the building. But the correlation between the occupant load formula for covered malls in Section 402 was not made - that is what is being fixed in this code change. The proposed language is intended to make the determination of the occupant load for a mall building (open or covered) consistent with changes documented in the retail industry.

Cost Impact: The code change proposal will decrease the cost of construction
If successful this should decrease the cost of construction as fewer means of egress elements would be required.

G51-21

G52-21

IBC: 402.8.5

Proponents: Alex Miear, representing Code Consultants, Inc. (CCI) (alexm@codeconsultants.com)

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

2021 International Building Code

SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS.

Revise as follows:

402.8.5 Distance to exits. Within each individual tenant space in a *covered* or *open mall building*, the distance of travel from any point to an *exit* or entrance to the *mall* shall be not greater than 200 feet (60 960 mm).

The distance of travel from any point within a *mall* of a *covered mall building* to an *exit* shall be not greater than 200 feet (60 960 mm). The maximum distance of travel from any point within an *open mall* <u>to an *exit* or</u> to the perimeter line of the *open mall building* shall be not greater than 200 feet (60 960 mm).

Reason Statement: The open mall building provisions essentially incorporate a covered mall building design without a roof. Travel distance within the mall of an open mall building should be permitted to terminate an exit, no different than permitted in a covered mall building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding the option to terminate the travel distance measurement at an exit will not impact the cost of construction.

G52-21

G53-21

IBC: 403.2.1, 403.2.1.1, TABLE 504.3, TABLE 504.4

Proponents: Shamim Rashid-Sumar, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete Association (ssumar@nrmca.org); Amy Trygestad, representing CRSI (atrygestad@crsi.org); Larry Williams, representing Steel Framing Industry Association (williams@steelframingassociation.org)

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.2.1 Reduction in fire-resistance rating. The *fire-resistance rating* reductions specified in Sections 403.2.1.1 and 403.2.1.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

403.2.1.1 Type of construction. The following reductions in the minimum *fire-resistance rating* of the *building elements* in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in *building height*, the *fire-resistance rating* of the *building elements* in Type IA construction shall be permitted to be reduced to the minimum *fire-resistance ratings* for the *building elements* in Type IB. The building height and building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.

   Exception: The required *fire-resistance rating* of columns supporting floors shall not be reduced.

2. In other than Group F-1, H-2, H-3, H-5, M and S-1 occupancies, the *fire-resistance rating* of the *building elements* in Type IB construction shall be permitted to be reduced to the *fire-resistance ratings* in Type IIA. The building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.
3. ~~The *building height* and *building area* limitations of a building containing *building elements* with reduced *fire-resistance ratings* shall be permitted to be the same as the building without such reductions.~~

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE[a]

OCCUPANCY CLASSIFICATION	See Footnotes	TYPE OF CONSTRUCTION											
		Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A, B, E, ~~F~~ F-2, M, ~~S~~ S-2, U	NS[b]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	~~180~~ 270[i]	~~85~~ 180	75	85	75	270	180	85	85	70	60
H-1, H-2, H-3, H-5	NS[c, d]	UL	160	65	55	65	55	120	90	65	65	50	40
	S												
F-1, H-4, S-1	NS[c, d]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	140	100	85	85	70	60
I-1 Condition 1, I-3	NS[d, e]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
I-1 Condition 2, I-2	NS[d, e, f]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85									
I-4	NS[d, g]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
R[h]	NS[d]	UL	160	65	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	~~180~~ 270[i]	~~85~~ 180	75	85	75	270	180	85	85	70	60

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

i. The required fire resistance of columns supporting floors in accordance with Table 601 shall be increased to 3 hours for Type IB buildings protected by an automatic sprinkler system and exceeding 180 feet.

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	3	3	3	2	1
	S	UL	~~6~~ 9	~~4~~ 6	3	4	3	9	6	4	4	3	2
A-2	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-3	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-4	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	~~12~~ 18	~~4~~ 12	3	4	3	18	12	6	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	1	1	1	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	~~12~~ 18	~~6~~ 12	4	6	4	18	12	9	6	4	3
E	NS	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	~~6~~ 9	~~4~~ 6	3	4	3	9	6	4	4	2	2
F-1	NS	UL	11	4	2	3	2	3	3	3	4	2	1
	S	UL	12	5	3	4	3	10	7	5	5	3	2
F-2	NS	UL	11	5	3	4	3	5	5	5	5	3	2
	S	UL	12	~~6~~ 8	4	5	4	12	8	6	6	4	3
H-1	NS[c, d]	1	1	1	1	1	1	NP	NP	NP	1	1	NP
	S							1	1	1			
H-2	NS[c, d]	UL	3	2	1	2	1	1	1	1	2	1	1
	S							2	2	2			
H-3	NS[c, d]	UL	6	4	2	4	2	3	3	3	4	2	1
	S							4	4	4			
H-4	NS[c, d]	UL	7	5	3	5	3	5	5	5	5	3	2
	S	UL	8	6	4	6	4	8	7	6	6	4	3
H-5	NS[c, d]	4	4	3	3	3	3	2	2	2	3	3	2
	S							3	3	3			
I-1 Condition 1	NS[d, e]	UL	9	4	3	4	3	4	4	4	4	3	2
	S	UL	10	5	4	5	4	10	7	5	5	4	3
I-1 Condition 2	NS[d, e]	UL	9	4	3	4	3	3	3	3	4	3	2
	S	UL	10	5				10	6	4			
I-2	NS[d, f]	UL	4	2	1	1	NP	NP	NP	NP	1	1	NP
	S	UL	5	3				7	5	1			
I-3	NS[d, e]	UL	4	2	1	2	1	2	2	2	2	2	1
	S	UL	5	3	2	3	2	7	5	3	3	3	2
I-4	NS[d, g]	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	6	4	3	4	3	9	6	4	4	2	2
M	NS	UL	11	4	2	4	2	4	4	4	4	3	1
	S	UL	12	5	3	5	3	12	8	6	5	4	2
R-1[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3

	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	8	5	4	3
R-2[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4	4								4	3
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	8	5	4	3
R-3[h]	NS[d]	UL	11									3	3
	S13D	4	4	4	4	4	4	4	4	4	4	3	3
	S13R	4	4									4	4
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	5	5	4	4
R-4[h]	NS[d]	UL	11									3	2
	S13D	4	4	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3
	S	UL	~~12~~ 18	~~5~~ 12	5	5	5	18	12	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	4	4	4	3	1
	S	UL	12	5	4	4	4	10	7	5	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	4	5	4	2
	S	UL	12	~~6~~ 8	4	5	4	12	8	5	6	5	3
U	NS	UL	5	4	2	3	2	4	4	4	4	2	1
	S	UL	6	5	3	4	3	9	6	5	5	3	2

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: As a consequence of changes made to Type IV buildings in the 2021 IBC, there is a misalignment in the relationship between building size and construction type for non-combustible construction. The proposed code change realigns building heights based on the original intent of the International Building Code and provides parity for identified occupancy classifications based on inherent fire resistance in a building's structure and envelope offered in Types I and II Construction. The revised heights and number of stories are based on the heights and number of stories allowed for Type IB and Type IIA buildings by the provisions of IBC Section 403.2.1.1 and align permitted heights of noncombustible construction to those of Type IV Construction.
The proposed changes pertain specifically to Assembly, Business, Education, Low Hazard Factory Industrial, Mercantile, Residential, Low Hazard Storage, and Utility and Miscellaneous occupancy groups based on their decreased level of hazard relative to other moderate and higher hazard occupancies. Recognizing the lower risk of these occupancy groups, this code change results in permitting Type IB and Type IIA Construction to be constructed to the same heights as Type IVA and IVB construction. These increases are attributed to the inherent fire resistance afforded through non-combustible construction, and the fact that the structures of Type IB and IIA buildings themselves to not contribute to the building fuel load. Furthermore, based on the provisions of IBC 403.2.1.1, buildings of Type IB and IIA Construction type are already being constructed to these heights. As such, the proposal for increased heights for buildings of Type IB construction is also based on provision of a minimum fire resistance of 3-hours for columns supporting floors in Type IB buildings exceeding 180 feet. Finally, Exception 3 of Section 403.2.1.1 is modified accordingly to remove additional height increases where inappropriate based on the changes presented.

The intent of the International Building Code, with respect to building size, recognizes the relationship between the size of a building and its intended use, occupancy classification and construction type. This intent is shown conceptually in Figure 1 below.

The IBC classifies Type I and Type II construction as the most resistant to the effects of fire and less likely to contribute to fire load, as the structural elements for Type I and Type II construction are made of non-combustible materials and will not ignite and burn when subjected to flame. As such, the design of buildings of Types I and II construction are intended to accommodate larger building sizes and increased number of building occupants as compared to Combustible construction Types III, IV and V.

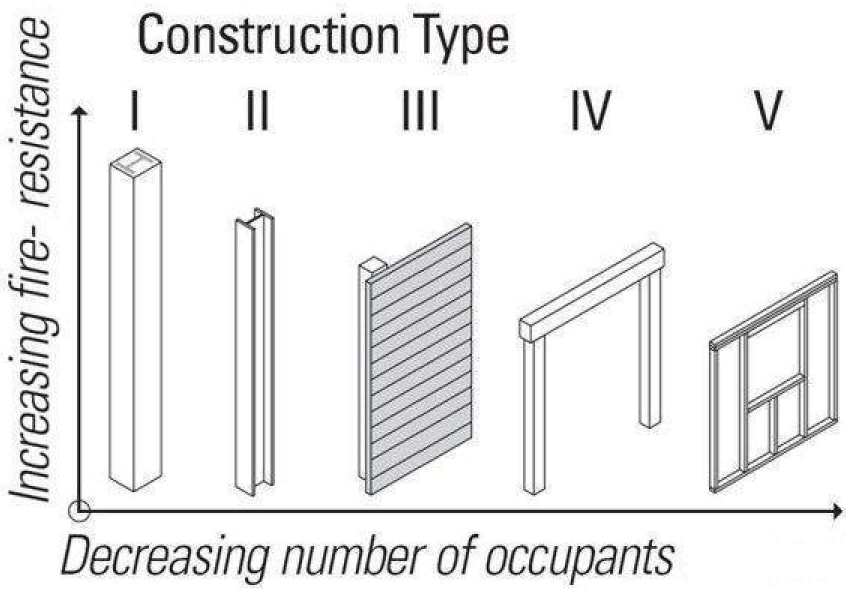


Figure 1. Adapted from John Wiley & Sons, from Building Codes Illustrated

Based on the extensive work completed by the ICC Ad-Hoc Committee on Tall Wood Buildings, modifications were made to certain construction types and their associated allowable heights in feet and number of stories. This resulted in a misalignment in the relationship between building size and construction type for non-combustible construction, as outlined in the example in Figure 2 for Residential Group R-1 and R-2 buildings protected by automatic sprinklers.

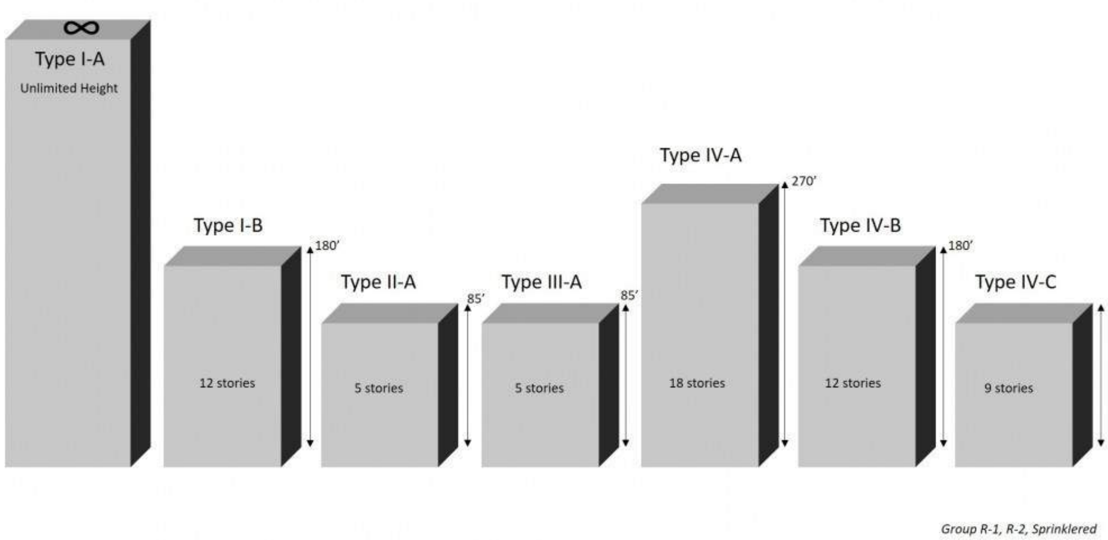


Figure 2. Comparison of Building Heights for Group R-1 and R-2 sprinklered buildings based on Construction Type in IBC [2021] Table 504.4.

For the same Residential Group R-1 and R-2 buildings protected by automatic sprinklers where exceptions of IBC [2021] Section 403.2.1.1 are applied, this example is modified as shown in Figure 3.

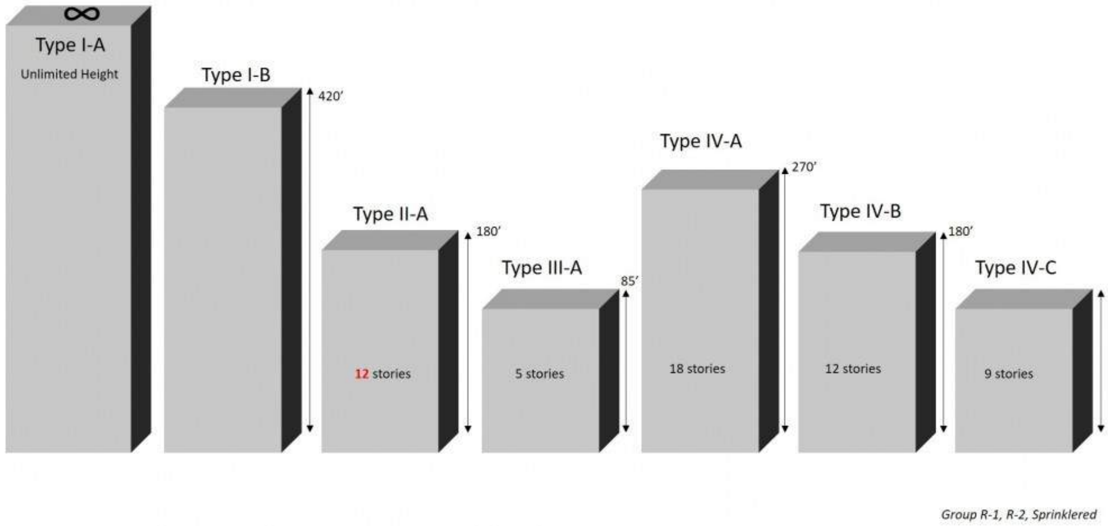


Figure 3. Comparison of Building Heights for Group R-1 and R-2 sprinklered buildings based on Construction Type reductions in ICS [2021] Section 403.2.1.1

For the proposed code change, Figure 4 illustrates no increases to building height over what is permitted by Section 403.2.1.1, and does not intend to present any decrease in the level of safety from the previous code edition based on the introduction of footnote i.

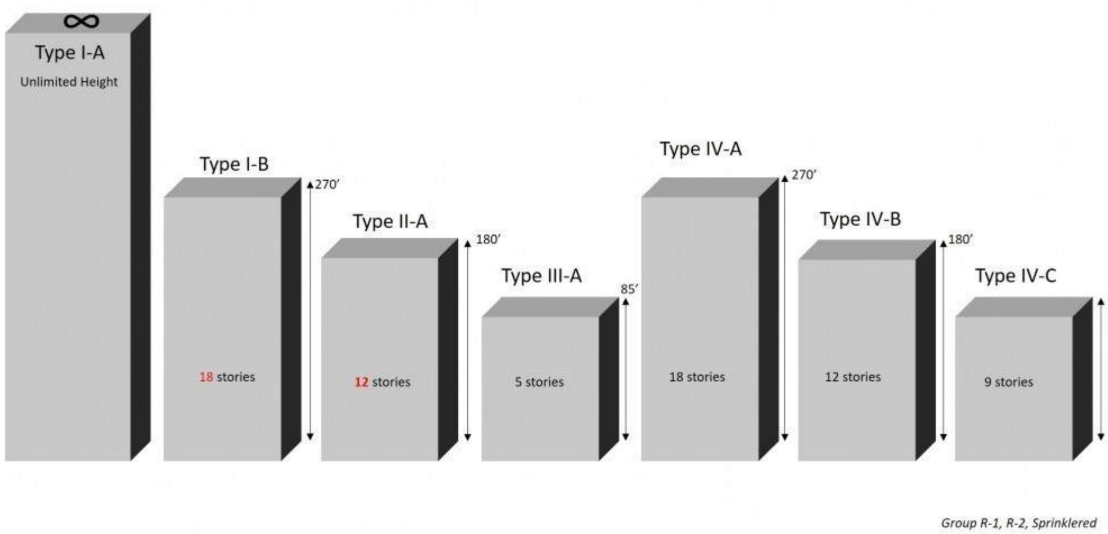


Figure 4. Comparison of Building Heights for Group R-1 and R-2 sprinklered occupancies based on proposed code change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
When considering overall cost impact, the proposal my decrease costs over time and increase returns on investment when considering factors such as increased gross leasable area and associated municipal revenues.

G53-21

G54-21

IBC: 403.2.1.1

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.2.1.1 Type of construction. The following reductions in the minimum *fire-resistance rating* of the *building elements* in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in *building height*, the *fire-resistance rating* of the *building elements* in Type IA construction shall be permitted to be reduced to the minimum *fire-resistance ratings* for the *building elements* in Type IB.

   Exception: The required *fire-resistance rating* of columns supporting floors shall not be reduced.

2. In other than <u>portions of a building containing</u> Group F-1, H-2, H-3, H-5, M and S-1 occupancies, the *fire-resistance rating* of the *building elements*in Type IB construction shall be permitted to be reduced to the *fire-resistance ratings* in Type IIA.
3. The *building height* and *building area* limitations of a building containing *building elements* with reduced *fire-resistance ratings* shall be permitted to be the same as the building without such reductions.

Reason Statement: It is common place for a high-rise building to have retail spaces on the First Floor. Simply having these spaces in limited areas of the building should not preclude the entire building from taking this reduction. The commentary for this section, which has remained consistent since at least the 1993 BOCA commentary, states that this reduction is not permitted for moderate-hazard buildings because of their customary higher fuel loads. This proposed change maintains the intent of the code by requiring areas of the building containing these moderate hazards to be constructed of Type IB and allowing other areas to utilize the reduction.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of construction will be reduced by allowing more buildings, or portions thereof, to qualify for this construction type reduction.

G54-21

G55-21

IBC: [F] 403.3; IFC: 914.3.1

Proponents: Mark Hopkins, TERPconsulting, representing TERPconsulting (mhopkins@terpconsulting.com)

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3 Automatic sprinkler system. Buildings and structures shall be equipped throughout with ~~an~~ *automatic sprinkler* ~~*system*~~ *systems* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 403.3.3.

> **Exception:** An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an *automatic* fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

2021 International Fire Code

914.3 High-rise buildings. High-rise buildings shall comply with Sections 914.3.1 through 914.3.7.

Revise as follows:

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with ~~an~~ *automatic sprinkler* ~~*system*~~ *systems* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

> **Exception:** An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

Reason Statement: The change is needed to clarify that multiple sprinkler systems are provided in a high-rise building based on the new definition of *automatic sprinkler system.* The context is that sprinkler protection is provided throughout the entire building in compliance with the code and referenced standard. This will not change only the difference in having a single system throughout versus having multiple systems providing protection throughout will change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Multiple sprinkler systems are already installed in high-rise buildings. This proposal is a clarification that does not increase construction cost.

G55-21

G56-21

IBC: [F] 403.3.1, [F] 403.3.1.1; IFC: 914.3.1.1, 914.3.1.1.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each a*utomatic* *sprinkler system* located in *fire protection system* zones of ~~zone in~~ buildings that are more than 420 feet (128 m) in *building height* shall be supplied by not fewer than two standpipes or express mains in accordance with Section 403.4.3 and 913.1 ~~risers~~. Each ~~riser~~ standpipe or express main shall supply the *automatic sprinkler systems* ~~*sprinklers*~~ on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

[F] 403.3.1.1 Riser location. ~~Sprinkler risers~~
Standpipes or express mains supplying *automatic sprinkler systems* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.1.

2021 International Fire Code

Revise as follows:

914.3.1.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each a*utomatic sprinkler system* located in *fire protection system* zones of ~~zone in~~ buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two standpipes or express mains in accordance with Section 905.1 and 913.1 ~~risers~~. Each standpipe or express main ~~riser~~ shall supply ~~sprinklers~~ *automatic sprinkler systems* on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

914.3.1.1.1 Riser location. ~~Sprinkler risers~~ Standpipes and express mains supplying a*utomatic sprinkler systems* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

Reason Statement: This code change is to remove the word zone from the International Building Code as it pertains to automatic sprinkler systems. The word zone is used and defined by NFPA 14 (standpipes), NFPA 20 (fire pumps) and NFPA 72 (fire alarms), however it is not used or defined by NFPA 13 or the IBC/IFC. It is confusing to apply zone to a sprinkler system when other installation standards use the term in a way that accounts for multiple floors or systems. Sprinkler systems are individual to each floor, meaning, each sprinkler system is required to have a floor control assembly which, by NFPA 13 and NFPA 25 definition, serves as a separate system. For example, a 50-story building, has at least 50 sprinkler systems, or one per floor. The term “fire protection system” is defined by the IBC/IFC and when used with the term zone, is better correlated with the other fire protection installation standards. A (vertical) fire protection zone is more commonly used by the installation standards (NFPA 14 and 20) for high rises of this height and better aligns with the original intent of G46-07/08.
This change also removes the word riser. Riser is meant to be the water supply through the standpipe system or directly in the express main(s) through the fire pump system. Using riser is not incorrect, but it confuses the terms used by NFPA 13. A riser is a vertical supply pipe in NFPA 13, but in high rises are usually combined with the standpipe system. To state “riser” in the IBC/IFC implies a separate feed to just the sprinkler system where the common practice (and intent of this section) is to use the standpipe system to be the water supply to each sprinkler system per floor.

Since the changes to this section by proposal G46-07/08 for the 2009 IBC/IFC, the current editions of NFPA 20 and NFPA 14 have had similar changes in regard to the NIST WTC report. NFPA 20 added Section 5.6 for very tall buildings which requires redundancy of fire pumps and water storage tanks for buildings beyond the pumping capacity of the fire pump. NFPA 14, expanded the technical explanation and application of zones in buildings.

This change keeps the redundancy of the original G46-07/08 intent but better works with the other standards that designers, engineers, and code officials use.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an editorial change and will not affect the cost of construction.

G56-21

G57-21

IBC: SECTION 202 (New), [F] 403.3.1, [F]403.3.1.1, 403.3.1.2 (New); IFC: SECTION 202 (New), 914.3.1.1, 914.3.1.1.1, 914.3.1.1.2 (New)

Proponents: Mark Hopkins, representing TERPconsulting (mhopkins@terpconsulting.com)

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

2021 International Building Code

Add new definition as follows:

SPRINKLER EXPRESS RISER. A vertical pipe used to supply water to sprinkler systems in a multiple story building.

VERTICAL WATER SUPPLY ZONE. A vertical fire protection zone within the standpipe system or group of floors supplied by a single sprinkler express riser in a high-rise building established by pressure limitations based on the design.

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

[F] 403.3.1 Number of sprinkler risers and system design. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in *building height* shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~
The number of sprinkler risers and design shall comply with Section 403.3.1.1 or 403.3.1.2 based on building height.

403.3.1.1 Buildings 420 feet (36.5 m) or less in height. In buildings 420 feet (36.5 m) or less in height, sprinkler systems shall be supplied by a single standpipe or *sprinkler express riser* within each *vertical water supply zone* .

403.3.1.2 Buildings over 420 feet (128 m) in height. In buildings over 420 feet (128 m) in height, a minimum of two standpipes or *sprinkler express risers* shall supply *automatic sprinkler systems* within each *vertical water supply zone* . Each standpipe or *sprinkler express riser* shall supply *automatic sprinkler systems* on alternating floors within the *vertical water supply* zone such that two adjacent floors are not supplied from the same riser.

[F] ~~403.3.1.1~~ 403.3.1.3 Riser location. Standpipes or ~~Sprinkler~~ *sprinkler express* *risers* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.1.

2021 International Fire Code

Add new definition as follows:

SPRINKLER EXPRESS RISER. A vertical pipe used to supply water to sprinkler systems in a multiple story building.

VERTICAL WATER SUPPLY ZONE. A vertical fire protection zone within the standpipe system or group of floors supplied by a single sprinkler express riser in a high-rise building established by pressure limitations based on the design.

914.3 High-rise buildings. High-rise buildings shall comply with Sections 914.3.1 through 914.3.7.

Revise as follows:

914.3.1.1 Number of sprinkler risers and system design. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~ The number of sprinkler risers and design shall comply with Section 914.3.1.1.1 or 914.3.1.1.2 based on building height.

Add new text as follows:

914.3.1.1.1 Buildings 420 feet (36.5 m) or less in height. In buildings 420 feet (36.5 m) or less in height, sprinkler systems shall be supplied by a single standpipe or *sprinkler express riser* within each *vertical water supply zone*.

914.3.1.1.2 Buildings over 420 feet (128 m) in height. In buildings over 420 feet (128 m) in height, a minimum of two standpipes or *sprinkler express risers* shall supply automatic sprinkler systems within each *vertical water supply zone*. Each standpipe or *sprinkler express riser* shall supply automatic sprinkler systems on alternating floors within the *vertical water supply zone* such that two adjacent floors are not supplied from the same riser.

Revise as follows:

~~914.3.1.1.1~~ 914.3.1.1.3 Riser location. Standpipe or *sprinkler express*

~~Sprinkler~~ *risers* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

Reason Statement: The context and application of Sections 403.3.1 is not clear. This section contains multiple requirements which are somewhat convoluted as currently written. Use of the terminology “sprinkler system zone” can be interpreted in multiple ways. The most common application is that a sprinkler system zone relates to all sprinklers and piping downstream of a floor control valve assembly. This is the context used in the NIST World Trade Center Investigation Report NCSTAR 1-4. However, based on the context of Section 403.3.1 and after reviewing the text of G46-0708 which was based on the NIST recommendations, the terminology sprinkler system zone is referring to a vertical sub-section of the overall building wide sprinkler system. Sprinkler system zone refers to all sprinklers and piping on floors supplied within a single *vertical water supply zone* based on design pressure limitations.
The inclusion of the term *standpipe* identifies that combined sprinkler and standpipe risers as used commonly used in the industry and permitted to be used by NFPA 14 to supply sprinkler systems within a *vertical water supply zone.* The diagrams included in Annex A of NFPA 14 have demonstrated this for many years. NFPA 14 Annex A uses the term “zone” which refers to the vertical loops limited by maximum pressure of pumps, gravity tanks, and equipment working pressure but does not explicitly define *vertical water supply zone.* NFPA 20 uses the term *vertical fire protection zone* which has similar if not identical meaning. Adding the terms *standpipe* and *vertical water supply zones* in this section will provide the needed clarification necessary for harmony between the requirements of the codes and referenced standards.

This change is also needed to clarify that there are differences in requirements for buildings having a *building height* greater than 420 feet (128 m). and buildings having a *building height* less than 420 feet (128 m). The change clarifies that a single *standpipe* or *sprinkler express risers* can be used to supply all sprinkler systems within a *vertical water supply zone.* The change also clarifies that there are a minimum of two risers required in buildings having a *building height* greater than 420 feet (128 m). The inclusion of the requirement for sprinkler systems to be supplied from two risers is to limit the impact of a single point failure of a standpipe or *sprinkler express riser.*

Figure 1 shows the configuration for a single *vertical water supply zone* in a building having a *building height less than 420 feet (128 m).*

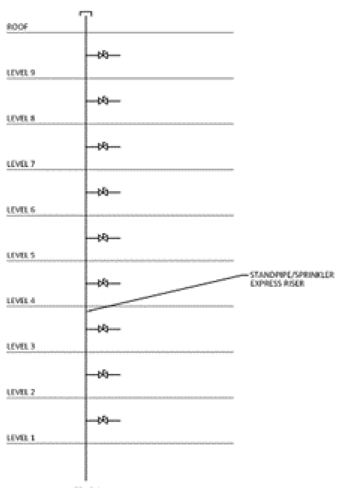


Figure 1. ***Sprinkler express risers or standpipes*** **in high-rise buildings having a** ***building height*** **less than 420 ft.**

The change also clarifies that two *standpipes* or *sprinkler express risers* are needed to supply sprinkler systems in buildings having a *building height* greater than 420 ft. Figure 2 shows the configuration for a building having a *building height greater than 420 ft.*

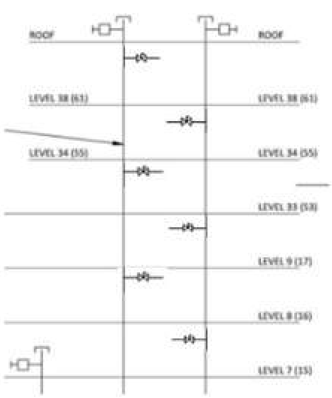


Figure 2. ***Sprinkler express risers or standpipes*** **in high-rise buildings having a** ***building height greater than*** **420 ft.**

The change to the relocated 403.3.1.3 is needed to clarify that a standpipe is permitted to be used to supply sprinkler systems. The change is also needed to identify that a *sprinkler express riser(s)* is required to be located within an *interior exit stairway(s) or ramp(s)*.

Cost Impact: The code change proposal will decrease the cost of construction
Clarifying this section reduces construction cost and design time.

G57-21

G58-21

IBC: [F] 403.3.3; IFC: 914.3.2

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

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

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

2021 International Fire Code

Revise as follows:

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

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

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

G58-21

G59-21

IBC: 403.5.3.1, 1009.8.1, UL Chapter 35 (New) [IFC[BE] 1009.8.1, UL Chapter 80 (New)]

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3.1 Stairway communication system. A telephone or other two-way communications system connected to an*approved constantly attended station* shall be provided at not less than every fifth floor in each *stairway* where the doors to the *stairway* are locked. Systems shall be listed to UL 2525 and installed per NFPA 72, or an equivalent standard acceptable to the authority having jurisdiction.

1009.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the*fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a *constantly attended location*, the two-way communication system shall have timed, automatic telephone dial-out capability that provides two-way communication with an approved supervising station or emergency services ~~9-1-1~~. The two-way communication system shall include both audible and visible signals. Systems shall be listed to UL 2525 and installed per NFPA 72, or an equivalent standard acceptable to the authority having jurisdiction

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

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

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

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

Reason Statement: A similar proposal was submitted during the 2018-2019 Group A Code Development Cycle (E35-18). This proposal intends to address questions that arose during that Committee Action Hearing and to include modifications to Section 403.5.3.1. NFPA 72 and UL 2525 are applicable to both code sections, hence a single code change proposal has been submitted.
As stated in the previous code change proposal, Section 1009.8 requires that a two-way communication system be installed at the landing serving each elevator or bank of elevators on an accessible floor that is one or more stories above or below the level of exit discharge. This system is vital for the accessible occupants of a building to communicate their need to be rescued in an emergency situation to the appropriate personnel. Currently, the IBC does not require these systems to be monitored for integrity. There is no way to ensure that these systems are operational if, and when, they are needed unless the systems are used at a non-required point in time and found to be in nonworking condition.

The first modification to Section 1009.8.1 is to address the term “emergency services” versus “9-1-1” as the latter is the colloquial term for emergency services in the USA. As this code may be utilized for international locations, and thus this verbiage modification is appropriate. A similar change is not proposed for Section 403.5.3.1 as high-rise buildings are required to be provided with fire command centers which either must be constantly attended, or the life safety systems are required to be monitored at approved constantly attended stations.

The NFPA 72 SIG-ECS committee recognized that the International Building Code (IBC) provided requirements for these systems, but installation requirements have not been correlated with the IBC to this point. This causes signification confusion on projects as to how these systems are to be designed and who should install these systems (e.g., fire alarm, electrician, low voltage, etc.?). The NFPA 72 committee has specifically addressed these concerns with an expanded section in the 2019 Edition of NFPA 72. By requiring this system to be designed and installed with these NFPA 72 requirements, the system's pathways will be monitored for integrity.

During the previous code development cycle, there was confusion as to the impacts of referencing NFPA 72, as well as the terms “area of rescue” vs. “area of rescue assistance”. The NFPA 72 committee recognized these issues, hence the title of the referenced NFPA 72 has been expanded. Further, referencing NFPA 72 does not mean that any building with an accessible floor that is one or more stories above or below the level of exit discharge requires a fire alarm system nor does it necessarily require that the system must be provided with a specific level of pathway survivability. The reference to NFPA 72 is intended to confirm that a two-way communication system is required to be installed per the installation and pathway survivability requirements for two-way communication systems of NFPA 72 Chapter 24. This proposal will provide direction on how to install these systems, and provide requirements for monitoring of the installed systems.

Further to pathway survivability, NFPA 72 outlines emergency communication systems installed in buildings of less than 2-hour fire-resistive construction may be provided with Level 1, 2 or 3 pathway survivability. Buildings of 2-hour fire-resistance or greater are to be provided with Level 2 or 3 pathway survivability. (This has been included in NFPA 72 since the 2013 edition, with the modification to allow Level 1 survivability included in the 2016 edition.)

Level 1 requirements consists of pathways that are located within fully sprinklered buildings in accordance with NFPA 13 with any interconnecting conductors, cables or other physical pathways protected by metal raceways or metal armored cables.

Level 2 requirements consists of 2-hour rated circuit integrity (CI) or fire resistive cable, 2-hour fire-rated cable system (electrical circuit protective system(s)), circuits located within 2-hour enclosures or protected areas, or performance alternatives approved by the AHJ.

Level 3 requirements meet Level 2 plus located within a fully sprinklered building in accordance with NFPA 13.

Example 1: A 3-story B occupancy of Type IIB construction that is fully sprinklered could utilize Level 1 survivability. As such, the conductors, cables or other physical pathways protected by metal raceways or metal armored cables would be acceptable. Further ratings of cables, conductors, etc., would not be required.

Example 2: A 5-story, R-1 occupancy of Type IB construction would require Level 2 or 3 pathway survivability as the building is of at least 2-hour fire-resistance.

Finally, this adds language to mandate compliance with the recently updated and released (June 12, 2020) edition of UL 2525 *Standard for Two-Way Emergency Communications Systems for Rescue Assistance*, which provides updated and adequate product listing requirements for these critical systems.

Bibliography: UL 2525 *Standard for Two-Way Emergency Communications Systems for Rescue Assistance*, 2020 Edition.

Cost Impact: The code change proposal will increase the cost of construction
However, these cost increases are justified as the code requirements to date have not provided the means of designing and installing these systems.

G59-21

G60-21

IBC: 403.5.3, 1010.2.7 (IFC[BE] 1010.2.7)

Proponents: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Assoc. (BHMA) (jwoestman@kellencompany.com)

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3 Stairway door operation. *Stairway* doors other than the exit discharge doors shall be permitted to be locked from the *stairway* side. *Stairway* doors that are locked from the *stairway* side shall be capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center*. Such stairway doors permitted to be locked from the stairway side shall automatically unlock without unlatching upon loss of power to the lock or electrical locking system.

1010.2.7 Stairway doors. Interior *stairway* means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. *Stairway* exit doors are permitted to be locked from the side opposite the egress side, provided that they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center*, if present, or a signal by emergency personnel from a single location inside the main entrance to the building. Such stairway doors permitted to be locked from the side opposite the egress side shall automatically unlock without unlatching upon loss of power to the lock or electrical locking system.
4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit stairway* where permitted in Section 1006.3.4.
5. *Stairway* exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the *dwelling unit* is from a single exit *stairway* where permitted in Section 1006.3.4.

Staff Note: Proposals E47-21, G60-21 and G61-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Sections 403.5.3 and 1010.2.7 both allow stairway doors to be locked to prevent re-entry from the stairway into the building. But, the current code does not include an important requirement that these locked doors, are to be equipped with locks that automatically unlock on the stairway side upon power failure (i.e. fail-safe locks). This ensures building occupants have the ability for re-entry from the stairway into the building, which may be critical for life safety.
Explanation of exit stairways, door locking, and what are commonly called “fail-safe” and “fail-secure” locks: When discussing “fail-safe” and “fail-secure” locks, both lock types typically allow free egress whether they are powered or not. But, from the access side of the door (ingress side), fail-safe locks are held in the locked position by electrical power, and default to the unlocked position when power is removed from the lock. Fail-secure locks remain locked when power is removed, preventing access or ingress to a space.

In means of egress stairways, the stairway side of doors may become the path of egress should the stairway become compromised by fire or smoke. Thus, when considering lock function from the stairway side of the door, fail-safe locks should be used which unlock upon loss of power permitting re-entry from the stairway into the building. Fail-secure locks should not be used on stairway doors (except stairway discharge doors) because a fail-secure lock would prevent re-entry from the stairway into the building if the lock loses power.

Cost Impact: The code change proposal will increase the cost of construction
This proposal may increase the cost of construction. Emergency or standby power systems may need to be connected to the stairway door locking systems permitted in these code section to help ensure the door locks remain locked where that’s important to the functioning of the building.

G60-21

G61-21

IBC: 403.5.3

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov)

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

2021 International Building Code

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.5.3 Stairway door operation. *Stairway* doors other than the exit discharge doors shall be permitted to be locked from the *stairway* side. *Stairway* doors that are locked from the *stairway* side shall be capable of being unlocked simultaneously without unlatching ~~a~~ <u>upon one of the following:</u>

1. <u>A</u> signal from the fire command center.
2. <u>Activation of a fire alarm signal in an area served by the stairway.</u>
3. <u>Failure of the power supply.</u>

Staff Note: Proposals E47-21, G60-21 and G61-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This is an important code change for high rise buildings that propose to lock stairway doors from the side opposite to the side from which egress is sought. It is not unusual during an emergency or power outage that building occupants need to access other stories of a building through the stairways. The IBC seems to include provisions for unlocking of locked stairway doors by fire fighting personnel when they arrive at the scene of the incident and assess the situation; it might be quite some time until someone trapped in a vertical exit way can exit the enclosure that may for example blocked at the bottom.
Frequently door locking systems are connected to emergency backup power sources or battery systems and as a result door do not unlock during an emergency. For example, during a power outage, fire department personnel may need to access floors from stairways to perform rescue or evacuation operations for elderly persons who may have difficulty evacuating the building. My jurisdiction had a vandalism incident where hose valves for standpipes serving an 8 level plus two basement building were simultaneously opened, and the fire department was not able to access stories from the stairwell side. The remote unlocking location was not accessible due to flooding and water flow put the building into alarm and evacuation was initiated. Occupants were trapped in the stairways due to rising water level at the discharge level. While not common, this incident highlights that there may be cases where occupants may require options prior to the arrival of fire rescue personnel at at the fire command center.

The Southern Nevada Building Officials have adopted the same requirement see attached.

We request that the General Committee vote to approve this sensible code change prompted by an actual incident in our jurisdiction albeit in a non-high rise building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code change will require that the door unlocking mechanism also connect to the fire alarm system however in most cases it already is either through the fire command center or due to common practice when a fire alarm system is present.

G61-21

G62-21

IBC: 404.6

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

SECTION 404 ATRIUMS.

Revise as follows:

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

Exceptions:

1. A *fire barrier* is not required where a glass wall forming a *smoke partition* is provided. The glass wall shall comply with all of the following:

   1.1. *Automatic* sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the *atrium* side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;

   1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and

   1.3. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic-closing.

2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 and having a $^3/_4$-hour *fire protection rating* is provided.

3. A *fire barrier* is not required between the *atrium* and the adjoining spaces of up to three floors of the *atrium* provided that such spaces are accounted for in the design of the smoke control system.

4. In other than Group I-2, and Group I-1, Condition 2, a ~~A~~ *fire barrier* is not required between the *atrium* and the adjoining spaces where the *atrium* is not required to be provided with a smoke control system.

5. In Group I-2 and Group I-1, Condition 2, a fire barrier is not required between the atrium and the adjoining spaces, other than care recipient sleeping or treatment rooms, for up to three stories of the atrium provided that such spaces are accounted for in the design of the smoke control system and are not providing access to care recipient sleeping or treatment rooms.

5.6. A *horizontal assembly* is not required between the *atrium* and openings for escalators complying with Section 712.1.3.

6.7. A*horizontal assembly* is not required between the *atrium* and openings for *exit access stairways* and *ramps* complying with Item 4 of Section 1019.3.

Reason Statement: These proposed changes to Section 404.6 Atriums brings the provisions of the IBC to be an equivalence to that of the 2012 Life Safety Code. As such it brings the provisions in alignment with federal regulatory guidelines for certification of health care facilities. A comparative review was made of the provisions of Section 8.6.7 of the 2012 LSC to that of the 2021 IBC sections 404.6. What is presented in the proposal addresses any differences in levels of protection or location of the protection required to separate the atrium from adjoining rooms or spaces. Further the provisions of IBC Sections 404.9 and 404.10 were compared to the provisions of Section 7.7.2 of the 2012 LSC and found to be equivalent. Review was based on the references from 2012 LSC section 18.3.1.1 – 18.3.1.5 for healthcare facilities with vertical openings.
This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should be no increase in the cost of construction for Group I-2 and Group I-1 condition 2 facilities as they had had to be constructed in conformity with LSC in order to gain federal certification. Facilities that don't receive federal certification also should not see significant cost increases as the proposal makes more of a change to the configuration of what can be adjoining rooms and spaces to the atrium.

G62-21

G63-21

IBC: 404.10

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

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

2021 International Building Code

SECTION 404 ATRIUMS.

Revise as follows:

404.10 Exit stairways in an atrium. Where an*atrium* contains an *interior exit stairway* all the following shall be met:

1. The entry to the *exit stairway* is the edge of the closest riser of the *exit stairway.*
2. The entry of the *exit stairway* shall have access from a minimum of two directions.
3. The distance between the entry to an *exit stairway* in an *atrium*and the entrance to a minimum of one *exit stairway* enclosed in accordance with Section 1023.2 shall comply with the separation required by Section 1007.1.1.
4. *Exit access* travel distance shall be measured to the closest riser of the *exit stairway*.
5. Not more than 50 percent of the *exit stairways* shall be located in the same *atrium*.
6. <u>The discharge from the exit stairway at the level of exit discharge shall comply with Section 1028.1.</u>

Reason Statement: Code Provisions allowing an Interior Exit Stair in an Atrium were first included in the 2018 edition of the IBC. The definition allows the design and construction of an interior exit stair in an atrium as part of the required means of egress from a building.
Interior exit stair is defined as:

[BE] INTERIOR EXIT STAIRWAY.

An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

Typically the design of an interior exit stairway provides a protected path through an enclosure for an interior exit stair as found in 1023.1. There are three specific provisions within this section: 1. required enclosure, 2. must lead directly to the exterior and 3. not used for any purpose other than means of egress and a circulation path. Section 1021.1 establishes the elements of construction that are intended to provide the design elements for an interior exit stairway, but adds additional specific features of them.

1023.1 General. *Interior exit stairways and ramps serving as an exit component in a means of egress system shall comply with the requirements of this section. Interior exit stairways and ramps <u>shall be enclosed</u> and <u>lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway</u> conforming to the requirements of Section 1024, except as permitted in Section 1028.1. An interior exit stairway or ramp <u>shall not be used for any purpose other than as a means of egress and a circulation path</u>.*

(NOTE: This is not a code change, the underlining is for emphasis only.)

The requirement for an enclosure of an interior exit stair is contained in Section 1023.2 (construction). The requirements for an interior exit stair to lead directly to the exterior is found in Section 1028 (exit discharge). A stairway used for an interior stair can't be used for any purpose other than means of egress and a circulation path. Section 1028 also provides for how an interior exit stair may pass through other functional areas within the building.
1023.2 Construction. *Enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps shall include any basements, but not any mezzanines. Interior exit stairways and ramps shall have a fire- resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.*

Exceptions:

1. *Interior exit stairways and ramps in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.*
2. *Interior exit stairways within an atrium enclosed in accordance with Section 404.6.*

(NOTE: This is not a code change, the underlining is for emphasis only.)

Exception 2 specifically allows the construction of an interior exit stair within an atrium per Section 404.6 to be used for compliance in lieu of the 2-hour fire-resistance rated and 1-hour fire resistance rated enclosure. Section 404.6 similarly states that a 1-hour barrier must be installed between the atrium and adjacent spaces, but provides four exceptions; 1. a glass wall, 2. A glass-block wall with ¾ hr. rating, 3. no wall where a maximum of three floors that are included in the design of the smoke control system, or no wall between the atrium and a maximum of three floors where a smoke control system is not required.

404.6 Enclosure of atriums.

Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier con- structed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

Exceptions:

1. A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:

1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;

1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and

1.3. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing.

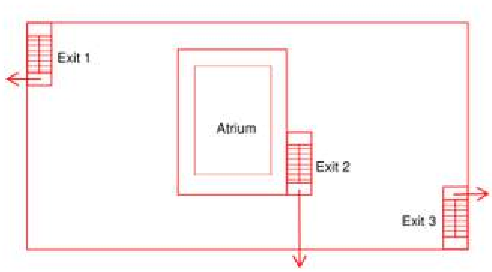
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.

3. A fire barrier is not required between the atrium and the adjoining spaces of up to three floors of the atrium provided that such spaces are accounted for in the design of the smoke control system.

4. A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.

(NOTE: This is not a code change, the underlining is for emphasis only.)

According to 1023.1, an interior exit stairway must not be used for any purpose except to serve as egress and circulation. A interior exit stairway in an atrium enclosure or in a standard stair enclosure are required to be kept clear and unobstructed and not to be used for any other purpose. It has been construed that this provision limits the entire atrium enclosure to not be used for any other purpose, but the code language in 1023.1 specifically speaks to the stairway as defined as an "interior exit stairway," not its enclosure.



This plan illustrates three interior exit stairs. Two that discharge directly to the outside and one stair that is located in the Atrium and discharges through an occupied space. All three stairs would be required to be enclosed, although Exit 2 will discharge through an occupied space that is contiguous with the atrium as permitted by Section 1028.1.

[BE] 1028.1 General.

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

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of interior exit stairways and ramps is permitted to egress through areas on the level of discharge provided that all of the following conditions are met:

1.1. Discharge of interior exit stairways and ramps shall be provided with a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.

1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.

1.3. The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. Portions of the level of exit discharge with access to the egress path shall either be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.

1.4. Where a required interior exit stairway or ramp and an exit access stairway or ramp serve the same floor level and terminate at the same level of exit discharge, the termination of the exit access stairway or ramp and the exit discharge door of the interior exit stairway or ramp shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the interior exit stairway or ramp and the last tread of the exit access stairway or termination of slope of the exit access ramp.

2. Not more than 50 percent of the number and minimum width or required capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided that all of the following conditions are met:

2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating of the interior exit stairway or ramp enclosure.

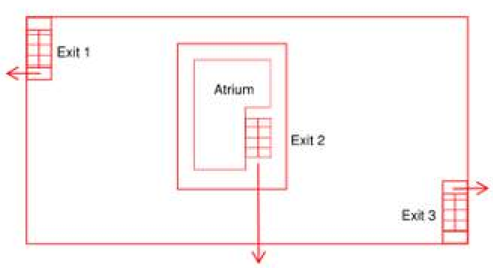
2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

2.3. The area is separated from the remainder of the level of exit discharge by a fire partition constructed in accordance with Section 708 of the International Building Code.

Exception: *The maximum transmitted temperature rise is not required.*

2.4. The area is used only for means of egress and exits directly to the outside.

3. Horizontal exits complying with Section 1026 shall not be required to discharge directly to the exterior of the building.



According to 1028.1, one of the exit stairs in the example plan would be allowed to discharge through the occupied space where the criteria for the path to the exterior met the requirements of this section. Similarly, when meeting these limits an interior exit stair in an atrium would be allowed to discharge through that same occupied space. Exit stair 2 in this configuration is unenclosed as permitted by 1023.2, exception 2 and per Section 404.6 because of the four exceptions which establish how an atrium is to be enclosed. The interior exit stair can discharge directly to the outside through an area on the level of exit discharge as would an enclosed stair.

In the 2021 edition of the IBC additional criteria have been added in Section 404.10 describing the conditions for design of an interior exit stairway in an atrium.

404.10.1 Exit stairways in an atrium.

Where an atrium contains an interior exit stairway all the following shall be met:

1. *The entry to the exit stairway is the edge of the closest riser of the exit stairway.*

2. *The entry of the exit stairway shall have access from a minimum of two directions.*

3. *The distance between the entry to an exit stairway in an atrium, and the entrance to a minimum of one exit stair stairway enclosed in accordance with Section 1023.2 shall comply with the separation in Section 1007.1.1.*

4. *Exit access travel distance shall be measured to the closest riser of the exit stairway.*

5. *Not more than 50 percent of the exit stairways shall be located in the same atrium.*

This code change adds a reference to Section 1018 for discharge from an atrium stair allowing it through an occupied space.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change simply clarifies that the discharge of the exit stairway in an atrium must comply with the same provisions for all exit stairways. This would not increase or decrease the cost of construction.

G63-21

G64-21

IBC: 405.5.1

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

SECTION 405 UNDERGROUND BUILDINGS.

Revise as follows:

405.5.1 Control system. A smoke control system is required on all floor levels for human occupancy located more than 30 feet below the lowest level of exit discharge. The smoke control system is required to control the migration of products of combustion in accordance with Section 909 and the provisions of this section. ~~Smoke control shall restrict movement of smoke to the general area of fire origin and maintain *means of egress* in a usable condition.~~

Reason Statement: For underground buildings required to comply with Section 405, the provisions of Section 405.5.1 do not clearly indicate whether smoke control is required to be provided on individual floor levels located 30 feet or less below the finished floor of the lowest level of exit discharge. As currently worded, this section could be interpreted to require all levels below the finished floor of the lowest level of exit discharge be provided with floor level smoke control whenever any one or more levels is located more than 30 feet below the finished floor of the lowest level of exit discharge.

The proposed change is to clarify that smoke control is only required on the specific level(s) that are located more than 30 feet below the finished floor of the lowest level of exit discharge. Floors that are less than that do not require smoke control.

The existing text requires the “means of egress” be maintained in a usable condition. By definition, “means of egress” includes the “exit access.” As the majority of a given floor level is would be considered exit access (e.g., rooms, open spaces, corridors, etc.), the current language is not feasible in many cases. Essentially, it requires all rooms/spaces to be maintained in a usable condition since they are all part of the exit access.

The purpose of Section 909, as identified in Section 909.1, is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. As such, the last line in the code section has been deleted.

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

G64-21

G65-21

IBC: 406.2.1

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.2.1 Automatic door ~~openers~~ operators and vehicular gates. Where provided, ~~Automatic~~ automatic garage door ~~openers~~ operators, and automatic rolling door operators or systems, shall be *listed* and *labeled* in accordance with UL 325. Where provided, *automatic vehicular gates* shall comply with Section 3110.

Reason Statement:

- Rolling door operators or systems should be included, since they can also be used in similar applications as automatic garage door openers, provided they are listed and labeled to UL 325.
- "Where provided" is needed, since automating a garage door or rolling door is at the discretion of the building owner or design professional.
- The term "operator" is used for consistency with the terminology used in UL 325.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarity and additional options for installation.

G65-21

G66-21

IBC: SECTION 202(New), 406.2.7, 406.2.7.1(New), TABLE 406.2.7.1(New), 406.2.7.2(New)

Proponents: Matt Frommer, Southwest Energy Efficiency Project, representing Southwest Energy Efficiency Project (mfrommer@swenergy.org)

2021 International Building Code

Add new definition as follows:

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

ELECTIC VEHICLE (EV)-CAPABLE SPACE. A designated parking space that is provided with conduit sized for a minimum 40-amp, 208/240-Volt dedicated branch circuit from a building electrical panelboard to within 3’ of the parking space and with sufficient physical space in the same building electrical panelboard to accommodate a 40-amp, dual-pole circuit breaker.

ELECTIC VEHICLE (EV)-READY SPACE. A parking space that is provided with one minimum 40-amp, 208/240-Volt dedicated branch circuit for *electric vehicle supply equipment* that is terminated at a receptacle, junction box or *electric vehicle supply equipment* located within 3 feet (915 mm) of the parking space.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)-INSTALLED SPACE. A designated parking space with dedicated *electric vehicle supply equipment* located within 3 feet (915 mm) of the parking space.

ELECTRIC VEHICLE (EV) FAST-CHARGER. *Electric vehicle supply equipment* with a minimum power output of 25 kW.

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Delete and substitute as follows:

~~**406.2.7 Electric vehicle charging stations and systems.** Where provided, electric vehicle charging systems shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be *listed* and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be *listed* and labeled in accordance with UL 2594. Accessibility to *electric vehicle charging stations* shall be provided in accordance with Section 1108.~~

406.2.7 Electric Vehicle (EV) Charging Infrastructure. Where parking is provided,*EV* charging infrastructure shall be provided in accordance with this section and installed in accordance with the National Electrical Code (NFPA 70). Where more than one parking facility is provided on a *site*, the number of *EV-capable, EV-ready,* and *EVSE-installed spaces* shall be calculated separately for each parking facility. When more than 10 parking spaces are added to an existing building, only the new parking spaces are subject to these requirements. *EVSE-installed spaces* may be used to meet requirements for *EV-ready* and *EV-capable spaces*. *EV-ready spaces* are permitted to be used to meet requirements for *EV-capable spaces.*

Exception: Parking facilities with fewer than 10 spaces.

Add new text as follows:

406.2.7.1 New Parking Facilities for Commercial Buildings. . New parking facilities shall be provided with *EV* charging infrastructure in accordance with Table 406.2.7.1. Calculations for the number of spaces shall be rounded up to the nearest whole number. *EVSE* serving *EVSE-installed spaces* shall be capable of supplying current at a minimum of 6.2 kW. All *EV-capable, EV-ready,* and *EVSE-installed spaces* are to be included in the calculation for the number of minimum vehicle spaces required.

Exception: The number of *EVSE-installed spaces* serving occupancies other than Group R-2 shall be permitted to be reduced by up to five for each parking space equipped with an *electric vehicle fast-charger* .

TABLE 406.2.7.1
EV CHARGING INFRASTRUCTURE

OCCUPANCY	EVSE-INSTALLED SPACES	EV-READY SPACES	EV-CAPABLE SPACES
Group R-2	2%	18%	N/A
All other occupancies	2%	N/A	8%

406.2.7.2 Identification. Construction documents shall designate all *EV-capable, EV-ready*, and *EVSE-installed spaces* and indicate the locations of conduit and termination points serving them. The circuit breakers or circuit breaker spaces reserved for the *EV-capable, EV-ready*, and *EVSE-installed spaces* shall be clearly identified in the panelboard. The conduit for *EV-capable spaces* shall be clearly identified at both the panelboard and the termination point at the parking space.

Reason Statement: Electric Vehicles (EVs) have emerged as a key climate strategy to reduce greenhouse gas (GHG) emissions from the transportation sector, the largest source of carbon pollution in the U.S. Interest in EVs has grown alongside greater model availability and increased vehicle range, and there are now well over 1.5 million EVs on the road in the U.S. Most industry experts agree that we are entering a big market transformation from gas-powered vehicles to electric.
This transformation is being accelerated by state and federal policy – over a dozen countries plus California and Massachusetts have announced plans to ban the sale of gasoline and diesel vehicles by 2035 or 2040. Twelve other states have adopted California's Zero-Emission Vehicle (ZEV) Standards requiring an increasing percentage of new vehicle sales to be electric each year and at least 3 others – Nevada, New Mexico, and Minnesota – plan to adopt the ZEV Standards in 2021. New buildings constructed with the 2024 IBC will only be 10 years old by the time all new vehicle sales are electric in these states. These government commitments have encouraged the biggest global auto manufacturers to electrify their vehicle models. By 2022, the U.S. market will have a selection of over 100 electric models including over 20 electric SUV and pickup truck models. The auto industry is investing $435 billion in electric transportation over the next decade. **Figure 1: Automaker Commitments to Electric Vehicles.**

Automaker	Electrification Commitment
Audi	20 new EV models by 2025. 800,000 EV sales annually (1/3 of all sales).
BMW	25 electrified vehicle models by 2025. 15 - 25% of annual sales are electric.
Ford	40 EVs by 2022: 16 BEVs, 24 PHEVs
General Motors	20 electric cars by 2023
Honda	2/3 of all sales to be electric by 2030. Every model to have EV option by 2022.
Hyundai Motor Group	44 EV models by 2025
Nissan	8 new EVs by 2022. EVs make up 20-30% of US sales by 2025.
Tesla	Sold 500,000 EVs in 2020.
Toyota	Half of sales are electric by 2025. Every model to have electric or hybrid option.
Volkwagen Group	70 new electric models by 2028. 1 million EVs sold by end of 2023.
Volvo	50% of sales are electric by 2025 (5 new BEVs by 2021)

Based on a 2019 survey, 63% of Americans are interested in EVs and 31% would consider one for their next vehicle purchase. However, the lack of access to EV charging stations continues to be a critical barrier to EV adoption. More specifically, there are significant financial and logistical hurdles for residents of multi-family dwellings and commercial building tenants to install EV charging stations.

A lack of pre-existing EV charging infrastructure, such as electrical panel capacity, raceways, and pre-wiring can make the installation of a new charging station cost-prohibitive for a potential EV-owner, so it's essential this equipment be included in building codes. The installation of an EV charging station is up to six times less expensive when the infrastructure is installed during the initial construction phase as opposed to retrofitting existing buildings to accommodate the new electrical equipment. In the absence of safe and convenient EV charging infrastructure, EV drivers are forced to improvise, running extension cords across sidewalks and parking lots to recharge their vehicles. By requiring EV charging infrastructure near the parking space, the IBC will address a critical safety hazard while giving consumers more choice of which vehicle they drive.

Over 40 municipalities around the country have already adopted EV infrastructure requirements for new residential and commercial buildings including Atlanta, Seattle, Denver, Boston, Fort Collins, New York, Sedona, Honolulu, Chicago, and Tucson. The absence of EV infrastructure requirements in the ICC model has created a patchwork of definitions and requirements with no common standards. For this reason, a group of EV advocates and energy efficiency experts proposed a set of residential and commercial EV infrastructure requirements (CE-217 Parts 1 and 2) in the 2021 IECC code development process.

At the ICC hearings in Albuquerque in 2019, the Commercial IECC Committee voted 8-3 to include CE-217 Part 2, EV infrastructure requirements for new commercial buildings, in the 2021 IECC model code. CE-217 Part 2 was later approved by 82% of the ICC governmental voting members. These governmental members are adopting and implementing the model codes in their communities and the 2021 IECC vote demonstrated overwhelming support for EV charging infrastructure requirements in the code.

After the vote, the National Association of Homebuilders and the American Gas Association appealed the decision on the grounds that the proposal was outside the scope and intent of the IECC. Ultimately, the ICC Appeals Board sided with the appellants and encouraged the ICC and the code proponents to find a more appropriate location for these requirements in the code. The IBC is a better location for EV charging infrastructure and many local governments have chosen to put EV requirements in this section of the code.

New residential and commercial buildings are constructed to last for 100 years or more, and so it is critical that charging infrastructure is incorporated at the pre-construction stage to ensure that new buildings can accommodate the charging needs of future EV-owners. Governments and automakers around the world have announced plans to move toward 100% electric transportation over the next two decades. It's time for the 2024 IBC model code to support the transition by including EV charging infrastructure requirements for new commercial buildings.

Bibliography:

1. SWEEP's EV Infrastructure Building Codes Adoption Toolkit (2020). https://www.swenergy.org/transportation/electric-vehicles/building-codes#cost
2. EV Infrastructure Building Codes Presentation (SWEEP & Denver Metro Clean Cities, 2020). docs.google.com/presentation/d/1qKQy_WWafr8tcqXzrNKDY24GxuXpLXt5PMcU0ZMD8BM/edit?usp=sharing
3. Chicago EV-Ready Building Codes Fact Sheet (2020). drive.google.com/file/d/1UTKLna78y3eSaLaWUCbE_TIpFpOwxxVl/view?usp=sharing
4. Plug-In Electric Vehicle Infrastructure Cost Analysis Report for CALGreen Nonresidential Update (Energy Solutions, 2019). caletc.com/wp-content/uploads/2019/10/CALGreen-2019-Supplement-Cost-Analysis-Final-1.pdf
5. Tesla Model Ordinance Related to EV Charging Infrastructure (2018). drive.google.com/file/d/1xRDa-oj0pyUbUgIg9mRUEjO2sSJxZW5M/view?usp=sharing
6. SWEEP blog: Cracking the Code on EV-Ready Building Codes (2018). www.swenergy.org/cracking-the-code-on-ev-ready-building-codes

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal will increase the cost of initial construction, but provide long-term savings for EV owners and commercial building owners through the avoided costs of installing EV charging infrastructure during a stand-alone retrofit.

The installation of EV charging infrastructure is four to six times less expensive when included during the initial construction phase as opposed to a retrofit. Several factors contribute to higher costs:

Demolition and repair of surface parking.
Breaking and repairing walls.
Longer conduit runs (also referred to as raceways) – Removing and repairing 100 - 300 linear feet of surface parking to add conduit can cost $11,500 to $32,000 in demolition and repair costs.
Upgrading electric service panels.
Soft costs: permits, plans, inspections, and project management.

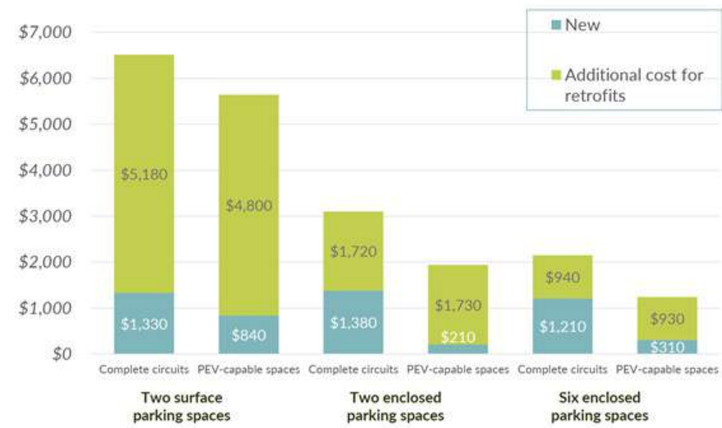
Given the momentum toward widespread EV adoption, the cost to pre-wire new buildings with EV charging infrastructure should be compared to the cost of installing the same equipment at a later date during a retrofit, rather than the cost of avoiding such equipment altogether.One study analyzed the cost implications of California's EV infrastructure building codes, which have been in place for 5 years, and found that each EV-Capable parking space installed in a multi-unit dwelling during new construction saves $2,040 - $4,635 over the retrofit scenario. Multiply those savings by the number of new EV charging stations required to provide charging access for millions of MUD residents and the potential savings amounts to billions of dollars that can be spent elsewhere in the economy.
Denver's EV infrastructure building code proposal included the following cost estimates for EV-Capable and EV-Ready parking spaces during new construction and stand-alone retrofit:

EV Infrastructure Requirement	During New Construction	During Retrofit	Savings
EV-Capable (panel capacity + raceway)	$300 per space	$2,500 per space	$2,200 per space
EV-Ready (full circuit)	$1,300 per space	$6,300 per space	$5,000 per space

These costs are highly dependent on the parking lot configuration, design, and number of EV-Capable or EV-Ready parking spaces. For their code update, the City of Oakland developed a detailed cost- effectiveness report with a range of cost savings estimates for different parking scenarios:

Figure 4.

Cost Savings for the City of Oakland (2020)



Definitions: "Complete circuits" = EV-Ready parking space, "PEV-capable space" = EV-Capable parking space.

The cost of EV-Capable infrastructure also varies by building size. A report prepared for the California Electric Transportation Commission measured the cost impact of a 10% EV-Capable parking requirement for small, medium, and large office and retail buildings, including cost estimates for alterations and additions. Larger buildings with more parking spaces reported a lower cost per EV-Capable parking space with economies of scale, but across all building sizes, the cost to install EV-Capable infrastructure during new construction is four to six times less expensive than during a stand-alone retrofit.

Figure 5. Estimated Cost of Installing EV Capable Parking per EV Capable Parking Space. Refer to Table 7 in the report for a more detailed breakdown of the costs by type of expense.

	Potential CALGreen 2019 Supplement - 10% of parking spaces		
	New Construction	Alterations & Additions	Stand-Alone Retrofit
Small Office/ Retail Surface Parking	$905	$925 to $1,178	$5,540
Medium Office/ School Surface Parking	$901	$928 to $1,322	$4,155
Large Office/ Retail/ Hospital Enclosed Parking	$739	$741 to $1,052	$2,779

The EV infrastructure costs may seem high, but the overall impact on building costs is low. An analysis done by the California Air Resources Board in 2018, examined the costs of adding EV Ready requirements for new multi-family developments. It found that adding panel capacity and conduit during new construction would add between 0.1% and 0.2% to the total building cost.

G67-21

IBC: 406.3.1, 406.3.2 (New)

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

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.1 Classification. *Private garages* and carports shall be classified as Group U occupancies. ~~Each *private garage* shall be not greater than 1,000 square feet (93 m^2) in area. Multiple *private garages* are permitted in a building where each *private garage* is separated from the other*private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.~~

Add new text as follows:

406.3.2 Allowable Area. Each private garage shall be not greater than 1,000 square feet (93 m^2) in area. Multiple private garages are permitted in a building where each private garage is separated from the other private garages by 1-hour fire barriers in accordance with Section 707, or 1-hour horizontal assemblies in accordance with Section 711, or both. Where located in a mixed occupancy building, the allowable area of the building shall be determined by including the area of the private garages as part of the area for one of the other occupancies.

Reason Statement: This proposal is to re-instate a provision that G59-12 incidentally removed. Item 1 of Section 406.3.2 of the 2012 IBC provided a path to include the area of a private garage as part of the major occupancy of the building. This allowed for attached private garages in buildings where they are commonly located to not cause a significant reduction in the allowable area of the entire building. G59-12 removed that provision without providing another measure to address it. Not allowing this often creates an unnecessary and significant reduction in the allowable area of the building. For instance, where located in a Group B or M, as the private garage is classified as a U, the allowable area of the non-sprinklered building is 5,500 instead of 9,000. Section 406.3.2, which does address other occupancies, would require compliance with 508 and therefore require a 2-hour fire barrier to allow minimal additional area.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will result in a reduction in cost of construction in cases where it will allow for a larger building without having to go to a more restrictive type of construction, or other method of area increase.

G67-21

G68-21

IBC: 406.3.1, 406.3.1.1 (New), 406.6.2

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.1 Classification. *Private garages* and carports shall be classified as Group U occupancies. ~~Each~~ A *private garage* shall be not greater than ~~1,000~~ 3,000 square feet ~~(93 m)~~ (279 m^2) in area. ~~Multiple *private garages* are permitted in a building where each *private garage* isseparated from the other *private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.~~ *Private garages* shall be atmospherically separated from enclosed parking garages *or open parking garages.*

Add new text as follows:

406.3.1.1 Multiple private garages. Multiple *private garages* are permitted in a building where each *private garage* has a floor area not greater than 1,000 square feet (93 m^2) and is separated from the other parking garages or *private garages* by 1-hour *fire barriers* in accordance with Section 707, or 1-hour *horizontal assemblies* in accordance with Section 711, or both.

Revise as follows:

406.6.2 Ventilation. A mechanical *ventilation* system and exhaust system shall be provided in accordance with Chapters 4 and 5 of the International Mechanical Code.

~~Exception~~ Exceptions:

1. Mechanical *ventilation* shall not be required for enclosed parking garages that are accessory to one- and two-family *dwellings*.
2. Mechanical *ventilation* shall not be required for enclosed private garages that have a floor area of 3,000 square feet (279 m^2) or less.

Reason Statement: The proposed code change is submitted to address what may have been an error in the adoption of a reduction to the permitted area for private garages when amendments to the 2012 IBC were debated, and ultimately approved in Portland. While not apparent then, code application for projects today reveals that what seemed to be a benign code change is placing significant burdens on small residential mixed-use projects and small non-residential projects incorporating private garages for their tenants. The code change did not consider the impacts on covered common parking areas that the IBC does not exclude from a Group U private garage classification (see figures 1, 2 below).
Reason for code change: Many urban Cities in the United States, like San Diego, are working to solve housing affordability issues and encourage infill development to eliminate blight. Frequently these projects are proposed on constrained sites and on sites that previously accommodated one or two single family dwellings with alley access from a 15 ft or 20 ft wide alley; some alleys are 10 ft wide but they are less common. Additionally, and to encourage walkable communities zoning regulations require some street frontage of non-residential space so a token office or small retail space are incorporated. The proposed code change seeks to permit small projects to incorporate private garages classified as Group U that have an area up to 3,000 sq ft as was the case prior to publication of the 2015 IBC. This code change will provide the following benefit:

- Will allow configurations with Group U private garages accessed by common driveways that are located below upper levels of the building.
- Will allow small parking garages to serve a mixed use building without classifying the garage as Group S-2 public or open garages. This will reduce the cost of construction and the need for mechanical ventilation or non-combustible construction.
- If constructed with non rated construction, this code change may lessen fire separation burdens on the alley side where FSD may be 10 feet to the center line of a 20 ft alley, since many projects are of Type VB construction.
- Will prevent gaming of the system where the common driveway is classified as Group S-2 and the private garages as Group U with separation only provided between group U private garages. Table 508.4 does not require a separation between Group S-2 and U since it does not expect both to be located in the same building or even parking area.
- Will prevent the need to divide up a small garage with fire barriers to satisfy the 1,000 sq ft area limit and require the installation of overhead rolling fire doors that will not be maintained.

Many of the proposed private garages need to exceed 1,000 sq ft to accommodate accessible parking, spaces with required electric vehicle chargers as well as residential and non-residential parking.

- We see project configurations with attached private garages in 4- or 5-unit buildings that have private vehicular entry doors and are served by drive aisles that are covered by the building above. The garage area is also about 1,800 to 3,000 sq ft. The area of the drive aisle which is under the building above is also classified as Group U and is additive to the Group U area. When designed to comply with the 2021 IBC these projects need to be divided by 1 or more fire barriers and the fire barriers require one or more roll up fire doors to accommodate drive aisles passing through or need to be placed in front of the attached private garages. An unnecessary level of complexity and a reliance on homeowners to maintain fire doors associated with unit garages make the regulations ineffective.

- When parking requirements for residential and non-residential uses are compounded with required accessible parking spaces for both residential and non-residential uses as well as spaces for electric vehicle charging systems a small project has no room for the placement of the 1-hour fire barriers and as a result another option is necessary. Vehicle stacker lifts are becoming popular to accommodate small garages however accessible and EV parking cannot be stacked and drive aisles and turning spaces are also needed to access all three types of spaces. The attached Figure 1 shows a mixed use 2 story building with two R-3 dwellings above a Group B and private garage for the use of residential and non-residential tenants.
- Consistent application of the code is not possible since a garage classified as Group S-2 does not require a separation from a private garage classified as Group U so applicant have separated private garages from one another with a 1-hour fire barrier and classified the drive aisle as Group S-2 with entry points of the drive aisle providing ventilation. The Figure 2 attached shows a garage/driveway covered by an R-2 building above.

The main reason that a Group U parking garage is desirable are the two following requirements:

1. Mechanical ventilation is not required for private garages but is required for public garages if not complying as open parking garages (IMC Section 404.1).
2. Exterior wall opening area limitations applicable to S-2 enclosed parking garages are significantly more onerous than for Group U, since the latter have no limit at FSD of 10 ft (due to IBC Table 705.5 allowance for zero fire resistance for exterior wall in zero rated type B construction per IBC 705.8.1 Exc 2). Only open parking garages get this benefit, group U private garages do not require openness to omit ventilation.

Code Change G59-12: The proposed code change provides a necessary update to the IBC to correct inadvertent issues that resulted from the adoption of G59-12 attached which was submitted by the Building Code Action Committee. The code changes revised Section 406 to complete regulations for private garages that somehow during the drafting of the 2000 IBC omitted necessary requirements for carports and the code change added definitions for private garages. Additionally, then Section 406.3.2 was deleted to not allows area increases to the then permitted 3,000 sq ft area limit. Section 406.3.1 was also revised to require a 1-hour fire barrier to separate private garages from one-another and most likely the building configuration envisioned was exterior driveways open to the sky providing access to a series of side by side double or tandem private garages that either had direct/indirect access to dwelling units.

- The code changed lowered the area threshold to 1,000 from the 3,000 sq ft that has existed since the publication of the 1967 UBC but did not provide justification for why it was necessary to reduce the area from a fire risk perspective.
- The justification also discussed the area limit in the context of natural ventilation openings and cited Section 402.2 of the International Mechanical code that requires “The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.” exterior openings. Furthermore, an additional general requirement in the charging Section 401.2 to the chapter 4 requires that “Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403.”
- If mechanical ventilation is not present the IMC requires natural ventilation for all uses and occupancies including private garages, and as a result there was no reason to reduce the area of garages due to ventilation concerns.

The proposed code change results in an option to allow a larger private garage that has been 3,000 sq ft for more than 45 years with no known issues due CO exposure or fire hazards. Additionally, auto emissions have improved significantly over the past 50 years and the prevalence of electric vehicles and hybrid vehicles further reduces vehicle emissions. Hazards in garages due to CO occur during long term exposure and where there is a constant flow of motor vehicles like in the case for example of below ground garages in regional shopping malls. The hazards are primarily to the parking toll taker when not automated.

Mixed use residential buildings are always protected at least with an NFPA 13-R system and the garages are protected with an NFPA 13 compliant system and this code change reasonably reinstates regulations that have existed for decades without lessening fire safety even with the increased hazards due to plastics in vehicles and difficulties in fighting fire in electric and hybrid vehicles due to batteries.

We request that the General Committee vote to approve this code change.

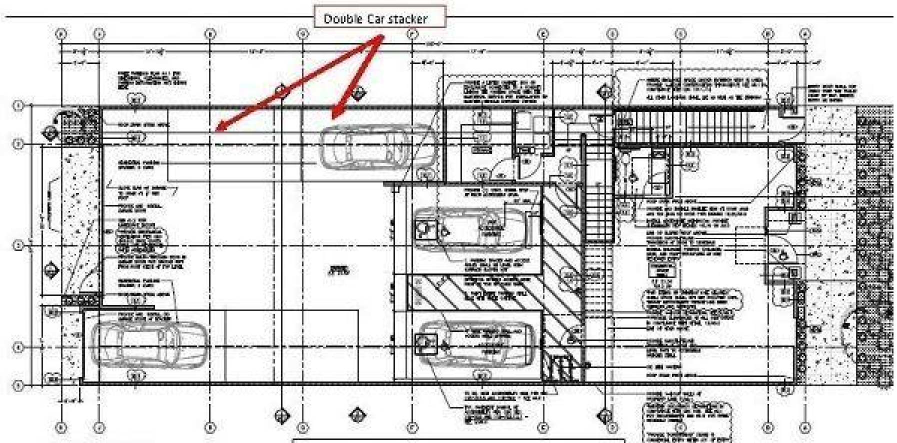


Figure 1

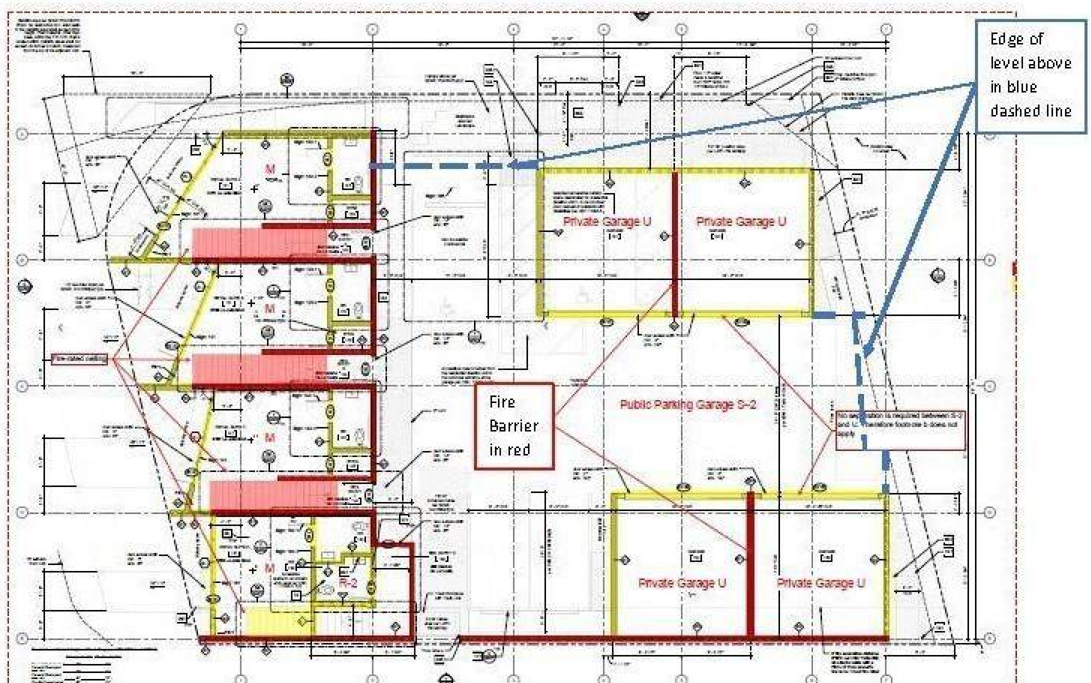


Figure 2

Cost Impact: The code change proposal will decrease the cost of construction
The proposal may reduce the need for mechanical ventilation systems in the garages and will reduce the need for fire barriers and opening protectives within them. The proposal also makes the projects more feasible.

G68-21

G69-21

IBC:406.4.2

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

2021 International Building Code

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.4.2 Vehicle barriers. *Vehicle barriers* not less than 2 feet 9 inches (835 mm) in height shall be placed at the following locations:

1. Where ~~where~~ the vertical distance from the floor of a drive lane or parking space to the ground or surface directly below is greater than 1 foot (305 mm).
2. Where occupiable space occurs in the direction of travel of an adjacent drive aisle.

Vehicle barriers shall comply with the loading requirements of Section 1607.10 .

Exception: *Vehicle barriers* are not required in vehicle storage compartments in a mechanical access parking garage.

Reason Statement: The existing provisions protect the occupants of the vehicle from the dangers of the vehicle falling some vertical distance. The proposed provision is intended to protect the occupants of directly adjacent occupiable space from the vehicles.
Increasing numbers of buildings are being constructed where the parking portions of the building are no longer separated by floors, but simply by light-frame or glass constructed walls. In these scenarios the safety of the users in the adjacent occupiable space is suspect. For the same reason that the existing provisions exist, a vehicle could unintentionally drive into the occupiable space just like it could drive off an elevation change. Drive aisles are more dangerous than parking spaces alone, as the vehicle has the potential to be traveling at a higher speed.

Cost Impact: The code change proposal will increase the cost of construction
Adds a requirement for barriers to parking garages that are adjacent to occupiable space.

G69-21

G70-21

IBC: TABLE 406.5.4

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, PCI, representing PCI (esmith@pci.org)

2021 International Building Code

Revise as follows:

TABLE 406.5.4
OPEN PARKING GARAGES AREA AND HEIGHT

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)		HEIGHT (in tiers)		
			Ramp access	Mechanical access	
	Automatic Sprinkler Protection			Automatic sprinkler system	
	No	Yes		No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	Unlimited	12 tiers	12 tiers	18 tiers
IIA	~~50,000~~ 75,000	125,000	10 tiers	10 tiers	15 tiers
IIB	50,000	100,000	8 tiers	8 tiers	12 tiers
IV	50,000	100,000	4 tiers	4 tiers	4 tiers

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

Reason Statement: When the International Building Code (IBC) drafting committees were developing the IBC, they utilized open parking garage requirements modeled after the legacy codes (i.e BOCA National Building Code, Standard Building Code & Uniform Building Code). These requirements, reflected in Table 406.5.4, have allowed larger building footprint areas and numbers of stories (tiers) for open parking structures compared to unsprinklered Group S-2 Low Hazard Occupancies reflected in Tables 504.3, 504.4 and 506.2 for heights and area of typical buildings. These larger and taller open parking structures were based on the open sided features for the parking structure which reduced the risk of adverse impact from vehicle fires and the documented low fire risk vehicles pose to the stability of open parking structures[1],[2].
Later studies of fire experience in open parking structures in the United States still show that fires in open parking garages are still very low. The US Fire Administration statistics show an average of over 1.7 million fires [FA-311, *Fire in the United States 1994-2004,* 14th edition, August 2007] for the period from 1999 to 2002. When compared to the average total parking garage fires (1760 incidents) described in an NFPA study of parking garage fires [M. Ahrens, *Structure and Vehicle Fires in General Vehicle Parking Garages,* NFPA, January 2006] this represents less than 0.1% of the fire incidences. Further, one of the conclusions in a very recent study of fire incidences in parking structures in the United States, funded by the National Fire Protection Association Research Foundation [*Modern Vehicle Hazards in Parking Structures and Vehicle Carriers*, July 2020], states "*Though fires in vehicles are not uncommon, large fires in parking structures are fairly rare".* The study also noted most of the recent fire incidences "*have not involved any human fatalities and few injuries".*

Even though the fire history for open parking structures in the United States is very low, code change F110-18 approved in the 2018 code cycle required sprinkler protection in open parking garages. However, the code change did not adjust the permitted area for open parking structures in Table 406.5.4 based on the area increase for buildings with sprinkler protection embodied in Table 506.2.

Based on the low risk of vehicle fires and minimal resulting structural damage for open parking garages in the United States, and the open sided features of these open garages, this proposal will permit open parking garages of Type IIA, IIB and IV construction to include an area increase similar to that permitted for multi-story buildings with sprinkler protection in Table 506.2. The proposed area increase permitted for sprinkler protection of Type IIA open parking structures with 1-hour fire resistance is 150% of the previous unsprinklered values in Table 406.5.4. This increase in area is comparable to the permitted aggregate area for a 6-story S-2 occupancy of Type IIA construction with the sprinkler protection increase in Table 506.2. For Type IIB and IV open parking structures, the increase is set at 100% of the previous unsprinklered values in Table 406.5.4 since these construction types do not have the 1-hour fire resistance and should be credited with less of an increase.

In addition, like Table 506.2 where unsprinklered S-2 occupancy buildings of Type IIA are permitted to be constructed 50% larger than an S-2 occupancy building of Type IIB construction because of the added 1-hour structural fire resistance, this proposal adjusts the unsprinklered Type IIA open parking garage area to 50% larger than an unsprinklered open parking garage of Type IIB construction.

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

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

Cost Impact: The code change proposal will decrease the cost of construction
This code change will reduce the cost of construction by permitting larger areas of open parking garages without having to increase the fire resistance of the structure.

G70-21

G71-21

IBC: 407.4.4, 407.4.4.4 (New)

Proponents: William Koffel, representing Self (wkoffel@koffel.com)

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

2021 International Building Code

SECTION 407 GROUP I-2.

Revise as follows:

407.4.4 Group I-2 care suites. *Care suites* in Group I-2 shall comply with Sections 407.4.4.1 through ~~407.4.4.4~~ 407.4.4.5 and either Section ~~407.4.4.5~~ 407.4.4.6 or ~~407.4.4.6~~ 407.4.4.7.

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

Add new text as follows:

407.4.4.4 Circulating space within a care suite. The circulating space within a care suite providing the access to the door required in Section 407.4.4.3 shall have a minimum width of 36 inches (914 mm) and shall not be required to meet the requirements for a corridor or an aisle.

Revise as follows:

~~407.4.4.4~~ 407.4.4.5 Doors within care suites. Doors in *care suites* serving habitable rooms shall be permitted to comply with one of the following:

1. Manually operated horizontal sliding doors permitted in accordance with Exception 9 to Section 1010.1.2.
2. *Power-operated doors* permitted in accordance with Section 1010.1.2, Exception 7.
3. *Means of egress* doors complying with Section 1010.

Reason Statement: There is a lot of confusion regarding the space through which one travels within a Group I-2 care suite to gain access to the door leading to a corridor. Due to the definition of a corridor, some apply corridor requirements to this space. It has not been the intent of the Code that corridor requirements apply within these suites. If corridor requirements were to be applied, there would be limitations on the areas that may be open to the space, patient care would not be permitted in an area open to this space, dead end limits would apply, and corridor wall and door requirements would apply. Some have also required that the clear width of the space be 96 inches since that is the minimum width required for a corridor used for bed movement in a Group I-2 occupancy. Since the proposal language clearly states that the space is not a corridor a minimum width requirement is included.
This issue was identified during a meeting of the ICC Committee on Healthcare but the Committee did not have time to develop a proposal to address the issue. While the proponent is a member of the ICC Committee on Healthcare, the proposal has not been submitted on behalf of that Committee.

Acceptance of the proposal would be consistent with the requirements in NFPA 101 which is used for Federal certification of most health care facilities.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies the intent of the Code and as such there should be no impact on the cost of construction.

G71-21

G72-21

IBC: 407.5.5, 408.6.4(New), 420.6.2(New), 422.3.4(New)

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

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

2021 International Building Code

SECTION 407 GROUP I-2.

Revise as follows:

407.5.5 Horizontal assemblies. *Horizontal assemblies* supporting *smoke barriers* required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke. Elevator lobbies shall be in accordance with Section 3006.2.

SECTION 408 GROUP I-3.

Add new text as follows:

408.6.4 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

SECTION 420 GROUPS I-1, R-1, R-2, R-3 AND R-4.

Add new text as follows:

420.6.2 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

SECTION 422 AMBULATORY CARE FACIILITIES.

Add new text as follows:

422.3.4 Horizontal Assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed in accordance with Section 711.2.4.4 to resist the movement of smoke.

Reason Statement: This proposal is intended to clarify that wherever the code requires the creation of smoke compartments with smoke barriers it also intends to have the horizontal assemblies that support those smoke barriers to be smoke barriers themselves in accordance with Section 711.2.4.4.Section 711.2.4.4's intent already requires this, but this proposal would clarify and more readily point out the already in place requirement. We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Just clarification of existing provisions

G72-21

G73-21

IBC: 410.1

Proponents: William Conner, American Society of Theatre Consultants, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.1 Applicability. The provisions of Sections 410.1 through 410.7 shall apply to all parts of buildings and structures that contain *stages* ~~or~~ ~~*platforms*~~ and similar appurtenances as herein defined.

Reason Statement: “Stage” designates a space for a particular activity, per the definition. Platforms are simply a constructed elements not affecting the fire hazard, a raised or built up floor area . This is a change consistent with the 1992 BCMC REPORT ON STAGES, PLATFORMS AND SOUND STAGES, which was the basis for the first edition of the IBC. It is a change from the pre-IBC code terms “stage” and “platform” as different and separate spaces with different risks, making the requirements more performance based and less a labeling game.
Prior to the 1992 BCMC report, a space could be a “legitimate stage” or a “platform” and that designation – a label on a drawing – determined what fire safety features were required by the code. The changes initiated by the BCMC report made heights and area the criteria for those fire safety features. Leaving this “or platforms” suggest that the space can be either a “stage” or a “platform”. On that basis, anything labeled a “platform” does not require any special fire protection features regardless of height or area. Designers and owners will use it just to save money, even though the fire hazard is no different than a stage. There are no requirements if it’s called a platform, an option that was not intended by the BCMC report.

A stage may or may not have a platform – raised floor area – but it will always have the potential for large amounts of combustibles – curtains and scenery – and always the usual source of ignition for fires in these spaces – stage and studio lighting – so should not be exempt from all protection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change. There were no general requirements for platform - only for construction materials.

G73-21

G74-21

IBC: 410.2.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1 Stage construction. *Stages* shall be constructed of materials as required for floors for the type of construction of the building in which such *stages* are located.

Exception: *Stages* need not be constructed of the same materials as required for the type of construction provided that the construction complies with one of the following:

1. *Stages* of Type IIB or IV construction with a nominal 2-inch (51 mm) wood deck, provided that the *stage* is separated from other areas in accordance with Section 410.2.4.
2. Stages are permitted to be constructed of fire-retardant-treated wood for Types I, II, and IV construction, provided that the stage is separated from other areas in accordance with Section 410.2.4.

2\. 3. In buildings of Type IIA, IIIA and VA construction, a fire-resistance-rated floor is not required, provided that the space below the *stage* is equipped with an *automatic sprinkler system* or *fire-extinguishing system* in accordance with Section 903 or 904.

3\. 4. In all types of construction, the finished floor shall be constructed of wood or *approved* noncombustible materials. Openings through stage floors shall be equipped with tight-fitting, solid wood trap doors with *approved* safety locks.

Reason Statement: By allowing the use of fire-retardant-treated wood (FRTW) while maintaining the required separation, stages could provide improved fire resistance compared to the untreated wood currently permitted by Exception 1 for Types IIB and IV construction, for instance. Furthermore, FRTW is already allowed in permanent platforms for Types I, II, and IV construction (IBC Section 410.3).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change the original 3 options currently available. It adds a 4th option.

G74-21

G75-21

IBC: 410.2.1.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area <u>including the forestage area </u>and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. *Stage* height shall be measured from the lowest point on the *stage* floor to the highest point of the roof or floor deck above the *stage*.

Reason Statement: This change is to clarify that the performance area on the audience side of the proscenium wall, which frequently has scenery, curtains, and other combustibles, be included in the calculation of vent area.
Forestage area dictionary definition: forestage. noun. the part of a modern theater stage between the curtain and the orchestra (i.e., in front of the curtain) synonyms: apron, proscenium.

Hence, 'forestage' would normally be included in the 'entire performance area' listed in the section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Change is for clarification and will not change construction requirements.

G75-21

G76-21

IBC:410.2.1.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. *Stage* height shall be measured from the lowest point on the *stage* floor to the highest point of the underside of the roof or floor deck above the *stage*.

Reason Statement: The building code has settled on the stage height, a measurement in the vertical dimension of the volume of the stage, as a determining factor for other code requirements. The vertical dimension of the stage is used to quantify how much combustible stage scenery may be present and the effectiveness of fire suppression systems. Is it understood for this vertical measurement to be from the lowest point of the stage floor to the highest point of the underside of the roof deck or floor deck structure above. Measuring to the top of the roof deck, floor deck, or any other protruding roof elements, does not accurately gauge the volume usable for combustible stage scenery and proven and tested effective fire suppression. The limiting factor for scenery and fire suppression is the height of the bottom of the structure over the stage.
For example, if a roof mounted mechanical smoke evacuation system added +4'-0" of height to a portion of the roof, this does not allow for +4'-0" of additional space inside the stage for the storage of combustible stage scenery nor does it raise effective height of fire suppression systems. Therefore, this additional +4'-0" of height is not applicable to the measurement of stage height for code purposes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Change is for clarification and should have no impact on cost.

G76-21

G77-21

IBC: 410.2.4

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

<u>**Exception:** No separation is required of a stage from a seating area with an aggregate occupant load of 300 or less.</u>

Reason Statement: The time required for 300 or fewer occupants to egress does not justify this extra compartmentalization. This concept originated when all theatres with tall stages had seating for large number of people, many more than 300. Note that at this occupant load, all required exit access for the audience is permitted to be through the stage. This really allows the small spaces, typically a small flexible theatre or small recital hall, to not include some features that are not justified for the size an egress time.

Cost Impact: The code change proposal will decrease the cost of construction
Small theaters will not require a separation.

G77-21

G78-21

IBC: 410.2.4

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

> <u>**Exception:** No separation is required of a stage from a seating area where all stage and studio lighting within the stage is LED or produces less heat than LED. Signs shall be posted on stage indicating only LED stage lighting shall be used.</u>

Reason Statement: The overwhelming majority of stage fires have been stage lighting igniting curtains, scenery, and so on. The change from gas and open arc lighting at the turn of the nineteenth century ended the great era of stage fires, where the average life of a theatre was around five years before it burned down. The change from relatively high temperature incandescent stage lighting to solid state LED lighting virtually eliminates stage lighting as an ignition source.

Cost Impact: The code change proposal will decrease the cost of construction
This will lower cost of some facilities - or more likely allow them to be better for same cost - by eliminating the proscenium wall and the costs associated with it.

G78-21

G79-21

IBC: 410.2.4

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.4 Proscenium wall. Where the *stage* height is greater than 50 feet (15 240 mm), all portions of the *stage* shall be completely separated from the seating area by a *proscenium wall* with not less than a 2-hour *fire-resistance rating* extending continuously from the foundation to the roof.

> <u>**Exception:** Where a stage is located in a building of Type I construction, the proscenium wall is permitted to extend continuously from a minimum 2-hour fire-resistance-rated floor slab of the space containing the stage to the roof or a minimum 2-hour fire-resistance-rated floor deck above.</u>

Reason Statement: The purpose of the proposed code change is to clarify the code.
Stages in theaters and showrooms are often located in mixed-use facilities, not necessarily dedicated buildings. In such facilities, stages are typically not located in a space in which the floor is also the foundation of the building. On the contrary, in many mixed-use facilities that contain a stage that requires a proscenium wall, there are typically one or more occupied floor levels beneath the theater, showroom, ballroom, etc. containing the stage. The current language of IBC Section 410.2.4 would require the proscenium wall for these stages to dissect the entire height of the building even though the stage is only located in a single space within the building. The proposed code change would allow the proscenium to terminate at the 2-hour fire-resistance rated floor assembly of the space containing the stage. The proposed code change would only apply to stages in buildings of Type I construction since such buildings are required by IBC Table 601 to always have minimum 2-hour fire-resistance rated floor construction.

The intent of the proscenium wall required by Section 410.2.4 is to protect the audience from the potentially increased hazard on stages with heights greater than 50 feet, which permits multiple settings and large amounts of scenery in dense configurations (i.e., an increased fuel load). The proposed code change still meets the intent of Section 410.2.4, and there is precedence for allowing the 2-hour fire-resistance rated proscenium wall to terminate at a 2-hour fire-resistance floor assembly. Section 1026.2 requires horizontal exit separations to extend vertically through all levels of the building unless floor assemblies have a minimum fire-resistance rating of 2-hour with no unprotected openings. The proposed code change provides a similar allowance to that provided in Section 1026.2 for horizontal exit separations.

For reference, this approach of terminating proscenium walls has been successfully utilized for approximately 15 years in Southern Nevada.

Cost Impact: The code change proposal will decrease the cost of construction
This code change proposal could reduce the cost of construction as the two-hour wall could terminate into two-hour fire-resistance floor assemblies, or the roof, rather than extending through additional floor levels which do not contain the stage.

G79-21

G80-21

IBC: 410.2.7

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.2.7 Stage ventilation. Emergency *ventilation* shall be provided for *stages* larger than 1,000 square feet (93 m^2) in floor area, or with a *stage* height greater than 50 feet (15 240 mm). Such *ventilation* shall comply with Section 410.2.7.1 or 410.2.7.2.

Exception: No emergency ventilation is required for a stage serving a seating area with an aggregate occupant load of 300 or less.

Reason Statement: The time required for 300 or fewer occupants to egress does not justify the requirement for this. Generally these are black box (flexible) theatres, arena (“in-the-round”) theatres, recital halls, or facilities with similar and often flexible and/or undefined stage and seating areas. Relative to a full working stage with larger seating areas, the potential amount of combustibles in these small spaces is very small.

Cost Impact: The code change proposal will decrease the cost of construction
This may decrease the cost for a few facilities by eliminating vents.

G80-21

G81-21

IBC: 410.4.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.4.1 Separation from stage. ~~The *stage* shall be separated from dressing~~ Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the *stage* shall be separated from the stage and other parts of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than 2 hours for *stage* heights greater than 50 feet (15 240 mm) and not less than 1 hour for *stage* heights of 50 feet (15 240 mm) or less.

Reason Statement: This change is simply to be consistent with the 1992 BCMC REPORT ON STAGES, PLATFORMS AND SOUND STAGES, which was the basis for the first edition of the IBC. The section begins with: “410.4 Dressing and appurtenant rooms. Dressing and appurtenant rooms shall comply with Sections 410.4.1 and 410.4.2.” and this change makes this a requirement for those spaces. Means of egress components, the most common spaces appurtenant and contiguous to stages,and other higher hazard spaces, are already required to be protected by chapter 10 or elsewhere in the codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is close call but based on experience that most of these are in schools and budget is set, and money is just spent differently. There should be not changes for the amount of rated walls required.

G81-21

G82-21

IBC: 410.4.1, 410.4.2

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com); Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

410.4.1 Separation from stage. The*stage* shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments ~~appurtenant~~ contiguous to the *stage* and other parts of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than 2 hours for *stage* heights greater than 50 feet (15 240 mm) and not less than 1 hour for *stage* heights of 50 feet (15 240 mm) or less.

410.4.2 Separation from each other. Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments ~~appurtenant~~ contiguous to the *stage* shall be separated from each other by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason Statement: .
Conner:

An “appurtenant” space may be down the corridor or in an adjacent building; where as a contiguous space is adjacent and connected, “sharing a common border or touching” in many definitions. This requirement is to protect stages and auditoriums from the fire hazards unique to shops, dressing rooms, storage, and such spaces associated with the performing arts.

Maiel:

The word “appurtenant” is confusing. In the dictionary, this word is defined as “pertinent” and “accessory” . The word “pertinent” is defined as: “having some connection with matter at hand”, “relevant”. Any of these definitions could distort the intent of the code. Apparently, this word came into the code from BOCA. The last UBC (1997) used word “contiguous” for these two sections which is more appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Conner: No change, just for clarity.

Maiel: This change makes the intend of the code more clearer. It does not change any technical requirement.

G82-21

G83-21

IBC: [F] 410.6; IFC: 914.6.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

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

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

[F] 410.6 Automatic sprinkler system. Buildings and structures that contain s*tages s*hall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the *stage*. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such *stages*.

Exceptions:

1. Sprinklers are not required under *stage* areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X *gypsum board* not less than $^5/_8$-inch (15.9 mm) in thickness.
2. Sprinklers are not required for *stages* 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on *stages*.

2021 International Fire Code

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

Revise as follows:

914.6.1 Automatic sprinkler system. Buildings and structures that contain stages shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^5/_8$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

Reason Statement: This change clarifies Section 410.1 requirement for application, "...to all parts of the buildings and structures..." Section 410.6 leaves the user with the possibility to interpret that only requires stages to be protected and the rest of the building unprotected. The commentary supports this by allowing a limited area system for the stage. The "tradeoffs" or exceptions in Section 410.6 could not or should not apply, unless the whole building is sprinklered throughout. Sections 410.2.1 and 410.5.3.2 require the entire building to be sprinklered.

Cost Impact: The code change proposal will increase the cost of construction
Additionally, most assembly or educational occupancies where stages would be located, would normally be protected anyhow.

G83-21

G84-21

IBC: [F] 410.6; IFC: 914.6.1

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

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

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Revise as follows:

[F] 410.6 Automatic sprinkler system. *Stages* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the *stage*. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such *stages*.

Exceptions:

1. Sprinklers are not required under *stage* areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X *gypsum board* not less than $^5/_8$-inch (15.9 mm) in thickness.
2. Sprinklers are not required for *stages* 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on *stages*.
4. Sprinklers are not required under catwalks and galleries under the maximum widths as permitted by NFPA 13.

2021 International Fire Code

Revise as follows:

914.6.1 Automatic sprinkler system. Stages shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^5/_8$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.
4. Sprinklers are not required under catwalks and galleries under the maximum widths as permitted by NFPA 13.

Reason Statement: This is common practice on most projects. Catwalks under 48" open on both sides or 36" when against a wall like ducts do not require sprinklers under them. This change clarifies that.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No significant change.

G84-21

G85-21

IBC: [F] 410.7; IFC: 905.3.4 (IBC: [F] 905.3.4), 905.5.1 (IBC:[F] 905.5.1), 914.6.2

Proponents: William Conner, representing American Society of Theatre Consultants (bill@bcaworld.com)

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

2021 International Building Code

SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS.

Delete without substitution:

~~**[F] 410.7 Standpipes.** *Standpipe systems* shall be provided in accordance with Section 905.~~

2021 International Fire Code

Delete without substitution:

~~**905.3.4 Stages.** Stages greater than 1,000 square feet (93 m^2) in area shall be equipped with a Class III wet standpipe system with 1$^1/_2$-inch and 2$^1/_2$-inch (38 mm and 64 mm) hose connections on each side of the stage.~~

> ~~**Exception:** Where the building or area is equipped throughout with an *automatic sprinkler system*, a 1$^1/_2$-inch (38 mm) hose connection shall be installed in accordance with NFPA 13 or in accordance with NFPA 14 for Class II or III standpipes.~~

905.5 Location of Class II standpipe hose connections. Class II standpipe hose connections shall be located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose. Class II standpipe hose connections shall be located where they will have *ready access*.

Revise as follows:

905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with *occupant loads* of more than 1,000, hose connections shall be located ~~on each side of any stage,~~ on each side of the rear of the auditorium, on each side of the balcony and on each tier of dressing rooms.

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

Delete without substitution:

~~**914.6.2 Standpipe system.** Standpipe systems shall be provided in accordance with Section 905.~~

Reason Statement: Delete requirement for standpipes on stages. This requirement goes back 100+ years when most stages were staffed by trained employees and the standpipe with hose was intended for occupant fire fighting, not the fire service. Today, when most stages are in public schools without full time staff trained to fight fires on stages, it makes no sense. It is an archaic requirement. More and more building and/or fire officials request or require these not be installed or, where installed, request these be removed, to discourage or prevent non-fire service occupants from fighting fires. I do not believe fire service would use these, located in the space where the fire is.

Cost Impact: The code change proposal will decrease the cost of construction
A very slight reduction by not requiring a standpipe but not the cost savings is not the reason for this proposal.

G85-21

G86-21 Part I

PART I - IBC: SECTION 202, 411.1, 411.5, 411.6, 411.6.1, 411.7, TABLE 903.2.11.6; ICCPC: [BG] A103.1.9.12
PART II - IFC: 105.5.3, SECTION 202 (New), TABLE 903.2.11.6, 907.2.12 (IBC[F]907.2.12), 907.2.12.1(IBC[F]907.2.12.1), 907.2.12.2(IBC[F]907.2.12.2), 907.2.12.3(IBC[F]907.2.12.3), 914.7, 914.7.2, 914.7.2.1 (New), 914.7.2.2 (New), 914.7.2.3 (New); IBC: [F]411.3, 411.3.1 (New), 411.3.2 (New), [F]411.4

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

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

2021 International Building Code

Revise as follows:

[BG] SPECIAL AMUSEMENT AREA. ~~A special amusement area is any~~ temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

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

[BG] PUZZLE ROOM. A puzzle room is a type of *special amusement area* in which occupants are encouraged to solve a challenge to escape from a room or series of rooms. A puzzle room is sometimes referred to as an escape room.

SECTION 411 SPECIAL AMUSEMENT AREAS.

Revise as follows:

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

~~Exception~~ Exceptions:

1. Special amusement areas that are without walls or a roof and constructed to prevent the accumulation of smoke ~~need~~ are not required to comply with this section.
2. *Puzzle rooms* provided with a *means of egress* that is unlocked, readily identifiable and always available are not required to comply with this section.

Delete without substitution:

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

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

Revise as follows:

411.4 ~~411.6~~ Exit marking. Exit signs shall be installed at the required *exit* or *exit access doorways* serving *special amusement areas* in accordance with this section and Section 1013. *Approved* directional exit markings shall be provided. Where mirrors, mazes or other designs ~~are utilized that~~ disguise the path of egress travel such that ~~they are~~ the path of egress travel is not apparent, *approved* and *listed* low-level exit signs that comply with Section 1013.5, and directional path markings *listed* in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the *automatic smoke detection system* and the *automatic sprinkler system* in accordance with Section 411.3.2. ~~907.2.12.~~

~~411.6.1~~ 411.4.1 Photoluminescent exit signs. Where *photoluminescent exit* signs are installed, such signs shall be *listed*, and the activating light source and viewing distance shall be in accordance with the listing and markings on~~of~~ the signs.

411.5 ~~**411.7**~~ **Interior finish.** ~~The~~ ~~*interior*~~ *Interior wall and ceiling* *finish* materials in *special amusement areas* shall ~~be~~ meet the *flame spread index* and *smoke-developed index* requirements for Class A in accordance with Section 803.1.

411.6 Flammable decorative materials. *Flammable decorative materials* shall comply with Section 806.

TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS

Portions of table not shown remain unchanged.

SECTION	SUBJECT
411.3	Special amusement ~~buildings~~ areas

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Revise as follows:

[BG] A103.1.9.12 SP-12, Special amusement area . A temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

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

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

It shall be assumed that:

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

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PART II - IFC: 105.5.3, SECTION 202 (New), TABLE 903.2.11.6, 907.2.12 (IBC[F]907.2.12), 907.2.12.1(IBC[F]907.2.12.1), 907.2.12.2(IBC[F]907.2.12.2), 907.2.12.3(IBC[F]907.2.12.3), 914.7, 914.7.2, 914.7.2.1 (New), 914.7.2.2 (New), 914.7.2.3 (New); IBC: [F]411.3, 411.3.1 (New), 411.3.2 (New), [F]411.4

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Add new definition as follows:

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

Delete and substitute as follows:

~~**SPECIAL AMUSEMENT BUILDING.** A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.~~

SPECIAL AMUSEMENT AREA. A temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

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

Revise as follows:

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

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

Portions of table not shown remain unchanged.

SECTION	SUBJECT
914.7.1	Special amusement areas ~~buildings~~

907.2.12 Special amusement areas~~buildings~~. Fire detection and alarm systems shall be provided in *special amusement areas* in accordance with Section 914.7.2.~~An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.12.1 through 907.2.12.3.~~

Delete without substitution:

~~**907.2.12.1 Alarm.** Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.~~

~~**907.2.12.2 System response.** The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the *automatic sprinkler system* or other *approved* fire detection device shall automatically do all of the following:~~

1. ~~Cause illumination of the *means of egress* with light of not less than 1 footcandle (11 lux) at the walking surface level.~~
2. ~~Stop any conflicting or confusing sounds and visual distractions.~~
3. ~~Activate an *approved* directional *exit* marking that will become apparent in an emergency.~~
4. ~~Activate a prerecorded message, audible throughout the special amusement building, instructing patrons to proceed to the nearest *exit*. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.~~

~~**907.2.12.3 Emergency voice/alarm communication system.** An emergency voice/alarm communication system, which is allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire special amusement building.~~

Revise as follows:

914.7 Special amusement areas. Special amusement areas shall comply with Sections 914.7.1 and 914.7.2.
Exceptions:

1. Special amusement areas that are without walls or a roof and constructed to prevent the accumulation of smoke need are not required to comply with this section.
2. *Puzzle rooms* provided with a *means of egress* that is unlocked, readily identifiable and always available are not required to comply with this section.

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

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement area is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point in the special amusement area to an *exit* is less than 50 feet (15 240 mm).

Revise as follows:

914.7.2 Detection and alarm systems. ~~Automatic smoke detection.~~ Buildings containing *special* ~~Special~~ amusement areas shall be equipped throughout with an *automatic smoke detection system* and an *emergency voice/alarm communications* system in accordance with Section 907 ~~907.2.12~~. Pre-signal alarms and alarm activation shall comply with Sections 914.7.2.1 and 914.7.2.2, and *emergency voice/alarm communications* systems shall comply with Section 914.7.2.3.

914.7.2.1 Alarm pre-signal. Activation of any single smoke detector, the *automatic sprinkler system* or any other single automatic fire detection device shall immediately initiate an audible and visible alarm at a constantly attended location at the *special amusement area* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 914.7.2.2.

914.7.2.2 Alarm activation. Activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, two or more other approved fire detection devices, the *automatic sprinkler system* , or a manual control located at the constantly attended station required by Section 914.7.2.1 shall automatically accomplish all of the following:

1. Automatically illuminate the means of egress with an illumination level not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop conflicting or confusing sounds and visual distractions.
3. Activate approved directional exit markings.
4. Activate a prerecorded message, audible throughout the special amusement area, instructing occupants to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinct from other sounds used during normal operation of the *special amusement area* .

914.7.2.3 Emergency voice/alarm communications system. An *emergency voice/alarm communications* system complying with Section 907.5.2.2 shall be installed in and audible throughout *special amusement areas.* The *emergency voice/alarm communications* system is allowed to also serve as a public address system.

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

> **Exception:** *Automatic* sprinklers are not required where the total floor area of a temporary *special amusement area* is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point in the *special amusement area* to an exit is less than 50 feet (15 240 mm).

Revise as follows:

411.3 Detection and alarm systems ~~Fire alarm system~~. Buildings containing *special amusement areas* shall be equipped throughout with an *automatic smoke detection system* and an *emergency voice/alarm communications* system in accordance with Section 907 ~~907.2.13~~. Pre-signal alarms and alarm activation shall comply with Sections 411.3.1 and 411.3.2, and *emergency voice/alarm communications* systems shall comply with Section 411.3.3.

Add new text as follows:

411.3.1 Alarm pre-signal. Activation of any single smoke detector, the *automatic sprinkler system* or any other single automatic fire detection device shall immediately initiate an audible and visible alarm at a constantly attended location at the *special amusement area* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 411.3.2.

411.3.2 Alarm activation. Activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, two or more other approved fire detection devices, the *automatic sprinkler system*, or a manual control located at the constantly attended station required by Section 411.3.1 shall automatically accomplish all of the following:

1. Automatically illuminate the means of egress with an illumination level not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop conflicting or confusing sounds and visual distractions.
3. Activate approved directional exit markings.
4. Activate a prerecorded message, audible throughout the special amusement area, instructing occupants to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinct from other sounds used during normal operation of the special amusement area .

Revise as follows:

[F] ~~411.4~~ 411.3.3 Emergency voice/alarm communications system. An *emergency voice/alarm communications system* ~~shall be provided in accordance with Section 907.2.12~~ complying with Section 907.5.2.2 shall be installed in and audible throughout special amusement areas. The emergency voice/alarm communications system is allowed to also serve as a public address system.

Reason Statement: This proposal executes numerous fixes and clean-ups related to Proposal G48-18, which updated some provisions related to special amusement buildings and added provisions for puzzle rooms. Unfortunately, there were some shortcomings in that proposal that remained undiscovered until after it was too late to fix these in the 2021 edition. Explanation for individual changes are as follows:
IFC:

- 105.5.3: Updates the old "special amusement building" references to the new "special amusement area" concept.
- 202: Updates and correlates the IFC definition of "special amusement area" with the updated 2021 definition in the IBC.
- Table 903.2.11.6: Updates the old "special amusement building" references to the new "special amusement area" concept.
- 907.2.12: Updates the old "special amusement building" references to the new "special amusement area" concept. Also, moves the content from 907.2.12 to 914.7 so that all of the special amusement area requirements are in one place. Section 914 is the appropriate location for all of this text.

- 914.7: Adds a reference to the IBC for other important safety requirements and brings in the exceptions that are currently in IBC Section 411, which negate having to comply with special amusement area requirements for outdoor areas and for some puzzle rooms. This addresses/eliminates a current conflict between the codes. The definition of "puzzle room" has also been pulled into the IFC from the IBC since the term will now appear in the IFC.
- 914.7.2: Brings in the fire alarm requirements previously located in 907.2.12 with edits for improved clarity. The term "throughout" has been added for clarity. The IBC Section 411.3 stated "buildings containing special amusement areas" require detection and alarm, and the term "throughout" emphasizes that the requirement applies to the building, not just the special amusement area per the IBC provision. Other changes in this section and the following sections in 914.7 are intended as non-technical edits to improve flow and clarity.

IBC:

- 202: The definition of special amusement area has been edited for clarity.
- Table 903.2.11.6 and Section 907.2.12 changes have the same reasons as companion changes to the IFC described above.
- 411.1: a second exception has been added for "puzzle rooms," a term that was added in the 2021 code by Proposal G48-18. This exception is essential for the proper application of Section 411 to puzzle rooms, but when Proposal G48-18 was entered into cdpACCESS last cycle, the text was somehow omitted, which went unnoticed until it was too late to fix the mistake in the 2021 code.
- 411.3: this section has been updated to correlate with the revised (herein) IFC Section 914.7 re detection and alarm systems.
- 411.5: this section should have been omitted from Proposal G48-18, but it was mistakenly included and went unnoticed until it was too late to fix the mistake in the 2021 code. When the second exception was added to Section 411.1, this section was no longer needed.
- 411.6 (now 411.4): changes are intended as non-technical clarifications. Re. photoluminescent signs, the section required compliance with listing criteria, but didn't previously have a specific reference that required listed signs.
- 411.7 (now 411.5): changes are intended as non-technical clarifications.
- 411.6 (new): regulation of flammable decorative materials was previously included in this section, but Proposal G48-18 inadvertently omitted it when the provisions were re-written.

ICC Performance Code

- Updates and correlates the introductory text, which was originally copied from the former definition of "special amusement building." The proposed text is copied from the 2021 definition of "special amusement area" in the IBC and proposed herein for the IFC.

Cost Impact: The code change proposal will decrease the cost of construction
Most of the recommended changes are non-technical and simply improve usability of the code. However, the change that adds a new exception for puzzle rooms will reduce the code of construction for some of these uses by not requiring qualifying puzzle rooms to meet regulations for special amusement areas.

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IBC: SECTION 202, 311.2, 311.2.1, 312.1, 312.3, 412.3, 412.4, 412.4.1 (New), 412.4.2, 412.4.3, 412.4.4, 412.4.5

Proponents: RONALD HEIDEBRINK, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

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Revise as follows:

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

[BG] RESIDENTIAL AIRCRAFT HANGAR. ~~An accessory building less than 2,000 square feet (186 m 2) and 20 feet (6096 mm) in building height constructed on a one- or two-family property where aircraft are stored.~~ A building or portion of a building where aircraft that are used by the owner or tenants of the building or buildings are stored or kept, without provisions for repairing or servicing such aircraft for profit. ~~Such use will be considered as a residential accessory use incidental to the dwelling.~~

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

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair) (see Section 412.3)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16-percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

311.2.1 Aircraft hangers. Aircraft hangars, other than *residential aircraft hangers*, ~~used for storage or repair~~ shall comply with Section 412.3.

Revise as follows:

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

- *Agricultural buildings*

- ~~Aircraft~~ <u>*Residential aircraft*</u> *hangars*, ~~accessory to a one- or two-family residence~~ (see Section 412.4)
- Barns
- Carports
- Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m^2)
- Fences more than 7 feet (2134 mm) in height
- Grain silos, accessory to a residential occupancy
- Livestock shelters
- *Private garages*
- Retaining walls
- Sheds
- Stables
- Tanks
- Towers

312.3 Residential aircraft hangars. ~~Aircraft~~ <u>*Residential aircraft*</u> *hangars* ~~accessory to a one- or two-family residence~~ shall comply with Section 412.4.

412.3 Aircraft hangars. <u>Group S-1 aircraft</u> ~~Aircraft~~ hangars shall be in accordance with Sections 412.3.1 through 412.3.6.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through ~~412.4.5~~ <u>412.4.6</u>.

Add new text as follows:

<u>**412.4.1 Classification.** Residential aircraft hangars shall be classified as Group U occupancies. Aircraft in the *residential aircraft hanger* shall be limited to aircraft weighing 12,500 gross pounds (5670 kg) take off weight or less.</u>

Revise as follows:

~~412.4.5~~ <u>412.4.2</u> Height and area limits. *Residential aircraft hangars* shall be not greater than 2,000 square feet (186 m^2) in area and 20 feet (6096 mm) in *building height*.

~~412.4.2~~ <u>412.4.3</u> Egress. A hangar shall provide two *means of egress* <u>in accordance with Chapter 10</u>. <u>Where the hanger is attached to a dwelling unit, one</u> ~~One~~ of the doors into the dwelling shall be considered as meeting only one of the two *means of egress*.

~~412.4.1~~ <u>412.4.4</u> Fire separation. A hangar shall not be attached to a*dwelling* unless separated by a *fire barrier* <u>, horizontal assembly or both</u> having a *fire-resistance rating* of not less than 1 hour. ~~Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the *dwelling unit*.~~ Doors into the *dwelling unit* shall be equipped with *self-closing* devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hangar directly into a room used for sleeping purposes shall not be permitted.

[F] ~~412.4.3~~ <u>412.4.5</u> Smoke alarms. *Smoke alarms* shall be provided within the hangar in accordance with Section 907.2.22.

~~412.4.4~~ <u>412.4.6</u> Independent systems. Electrical, mechanical and plumbing drain, waste and vent (DWV) systems installed within the hangar shall be independent of the systems installed within ~~the~~ <u>any attached</u> dwelling. Building sewer lines shall be permitted to be connected outside the structures.

Exception: *Smoke detector* wiring and feed for electrical subpanels in the hangar.

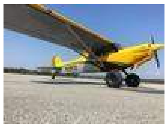
Reason Statement: The purpose of this proposal is to allow for personal small aircraft hangers to be considered Group U and not have to be on the same property as a house. Instead they will be limited by airplane size. This should be similar to a detached garage. An small airplane hanger is less dangerous than a private garage. Airplanes have safety requirement from the FAA for inspections to make sure engines, props and airframe are maintained. All aircraft have logbooks to document inspections and repairs. Airplanes have regulations for construction out of flame resistant or non-combustible materials.
Definition - The current definition includes technical criteria that is also in the text - so that is being proposed to be deleted. The new proposed text in the definition is based on the text for a private garage. Many hobbyist build or work on their own airplane, so allowing for repairing and serving the airplanes is necessary.

Section 412.3 is applicable to all aircraft hangars for the storage and repair of planes of all sizes. Section 412.4 is applicable to residential aircraft hangers. The references in Section 311.2, 322.2.1, 312.1, and 312.3 should use the defined terms and allow the sections to define the criteria.

412.3 - This is just restating the Group S-1 for this type of facility. This will also help differentiate the requirements from the much larger hangers from the hangers for the smallest aircraft.

Section 412.4 just allows a residential airplane hanger to comply with the specific provisions, or comply with the more restrictive general airplane hanger provisions. This is similar to private garages (406.3).

The new Section 412.4.1 Classification is restating the occupancy and then setting the limit on the plane size stored there. Examples are:



2018 Carbon Cub

Stearman

Stemme S10 Glider

New Section 412.4.3 (existing 412.4.1) is describing requirements for a fire barrier. The reference is more consistent with the rest of the code and will also address openings, joints and penetrations.

The section for egress (412.4.2) is revised in case the hangar is not connected to a house. Two exits are still required.

The sections are reordered to put the area limitations behind the classification systems, and group the fire separation and smoke alarms together. There are separate proposals related to the size and separation requirements.

Most airplane storage is not on the same lot as a house. Aircraft Owners and Pilots Association (AOPA) has 300,000 members, and Experimental Aircraft Association (EAA) having 130,000 members. Many of these members have more than one airplane.

Bibliography: Ref: 2018 IBC Commentary Sections 202, 412.3, 412.4.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing residential aircraft hangers to be constructed on a common runway increase options for small aircraft owners. The criteria is less expensive than the requirements for hangars that could house commercial planes of much larger size.

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IBC: SECTION 202, 412.4.5

Proponents: RONALD HEIDEBRINK, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

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Revise as follows:

[BG] RESIDENTIAL AIRCRAFT HANGAR. An accessory building ~~less than 2,000 square feet (186 m ^{2}) and 20 feet (6096 mm) in *building height*~~ constructed on a one- or two-family property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through 412.4.5.

Revise as follows:

412.4.5 ~~Height and area~~ Area limits. Residential aircraft hangars shall be not greater than ~~2,000~~ 5,000 square feet (~~186~~ 465 m^2) in area ~~and 20 feet (6096 mm) in building height~~.

Reason Statement: The purpose of this proposal is to allow for a larger size for 'residential aircraft hangars.'
A building of Group U of 5B construction is 5,500 sq.ft., 1 story and 40 feet high. A building of Group S-2 of 5B construction could be 14,500 sq.ft., 2 stories and 40 feet high. There is no technical justification for there to be additional limits on the height of a residential aircraft hanger - let it be controlled by the height tables in Chapter 6.

The current definition includes the size of the hangar. This is addressed in the revised Section 412.4.5, which is revised for the new size - 5,000 sq.ft. or less. This size is below the sprinkler thresholds for larger hangers in Table 412.3.6.

2000 square feet is not enough room to store today's aircraft. This is only large enough for one small personal plane with no extra space. You would not limit a home owner to a single car garage. I own 3 aircraft and they need to be stored and maintained, no different than my neighbor who collects Ford Mustangs and uses a large Group U barn to store them. Another reason for the increase in size is the necessity for the width of a door for certain aircraft. Gliders and some aircraft have a very large wing span. The doors need to be at least 4 feet wider than the wing spans.

Four examples are:

- Stemme S10 Glider with 75 feet 6 inches wingspan
- Antares 20E with 77 feet 7 inches wingspan
- Piper 350/500/600 with 43 feet wingspan
- Cessna 208 with 52 feet wingspan

Their are more with even larger wings. The engineers of the Steel Buildings need 3 feet each side to brace/support the 150 MPH wind load requirement. So, take 80 feet wide by 50 feet deep you get a 4000 square feet minimum for just one aircraft.

Bibliography: Ref: 2018 IBC Commentary Sections 202, 412.3, 412.4.

Cost Impact: The code change proposal will decrease the cost of construction
This allows for the hangars for private airplanes or gliders to meet the requirements for private residence airplanes rather than the same requirements that large commercial aircraft hangars have to meet.

G88-21

G89-21

IBC: 412.4.1, TABLE 705.5

Proponents: Ronald Heidebrink, Myrtle Beach Hardee Airpark ID SC21, representing Myrtle Beach Hardee Airpark (ron@gomyrtle.com)

2021 International Building Code

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

412.3 Aircraft hangars. Aircraft hangars shall be in accordance with Sections 412.3.1 through 412.3.6.

412.3.1 Exterior walls. *Exterior walls* located less than 30 feet (9144 mm) from *lot lines* or a *public way* shall have a *fire-resistance rating* not less than 2 hours.

412.4 Residential aircraft hangars. *Residential aircraft hangars* shall comply with Sections 412.4.1 through 412.4.5.

Add new text as follows:

412.4.1 Exterior walls. Exterior walls of *residential aircraft hangars* shall comply with Section 705.

> **Exception:** Detached *residential aircraft hangars* with a fire separation distance of 5 feet (1524 mm) or greater shall not be required to have a fire-resistance rating.

Revise as follows:

~~412.4.1~~ 412.4.2 Fire separation. A *residential aircraft* hangar shall ~~not be attached to~~ be separated from an attached ~~a~~ *dwelling* ~~unless separated~~ by a *fire barrier* having a *fire-resistance rating* of not less than 1 hour. Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the *dwelling unit*. Doors into the *dwelling unit* shall be equipped with *self-closing* devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hangar directly into a room used for sleeping purposes shall not be permitted.

705.5 Fire-resistance ratings. *Exterior walls* shall be *fire-resistance* rated in accordance with Table 601, based on the type of construction, and Table 705.5, based on the *fire separation distance* . The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

Revise as follows:

TABLE 705.5
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F-1, M, S-1[f]	OCCUPANCY GROUP A, B, E, F-2, I, R[i], S-2, U[h]
$X < 5$[b]	All	3	2	1
$5 \le X < 10$	IA, IVA	3	2	1
	Others	2	1	1
$10 \le X < 30$	IA, IB, IVA, IVB	2	1	1[c]
	IIB, VB	1	0	0
	Others	1	1	1[c]
$X \ge 30$	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.

b. See Section 706.1.1 for party walls.

c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.

d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

e. For special requirements for Group H occupancies, see Section 415.6.

f. For special requirements for Group S aircraft hangars, see Section 412.3.1.

g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

h. For a building containing only a Group U occupancy private garage, ~~or~~ carport or residential aircraft hanger, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

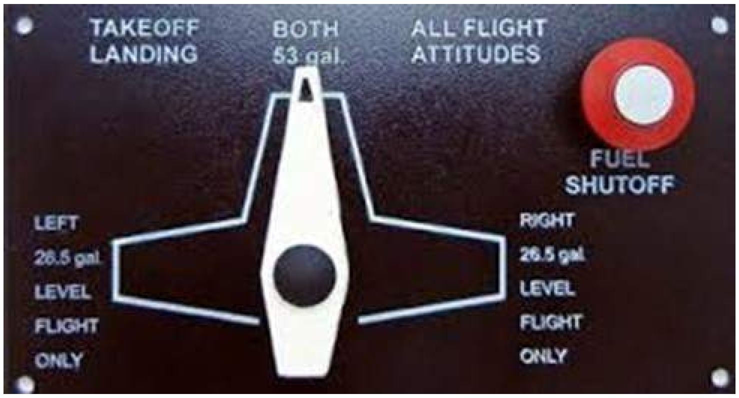
Reason Statement: The purpose of this proposal is to provide a break for detached residential aircraft hangar exterior walls, similar to parking for cars.
The exception in the new 412.4.1 is only for 'detached' hangars, so this is not the hangar attached to a house. This is similar to a detached garage. Moving this away from the house will increase resident safety. Residential aircraft hangars with small planes have a low hazard - even lower than private garages for cars given that the hangars are not typically used for the storage of 'extra stuff' you find in many private garages. Aircrafts are required by the FAA to have yearly safety inspections by a certified aircraft mechanic, so the airplanes themselves are safe.

The reference in footnote h of Table 705.5 is correlative.

The change in the current section 412.4.1 is just to used defined terms and to make this a positive statement. There is no change in requirements if a residential hangar is attached to a house.

Aircrafts are much safer than cares, motor homes or camper trailers. Aircraft have a master electrical shut off, fuel tank shut offs, interior and seat made from fire retardant materials., fire resistive wire insulation and fire extinguishers. Pilots must use checklists during all operations of aircraft. See pictures below. Motor homes carry two or more fuels, diesel or gasoline plus propane. When parked, they are plugged into 115 or 230 volt outlets. Aircraft of this small size only carry one fuel, gasoline.

There is a corelative change to limit the type of plane stored in the hanger and move them off a residential lot. The proposals can be considered separately, but they would also work together. Since planes have to get in and out and turn, the hangars may be close on the sides, but would have to be wide open at the front.

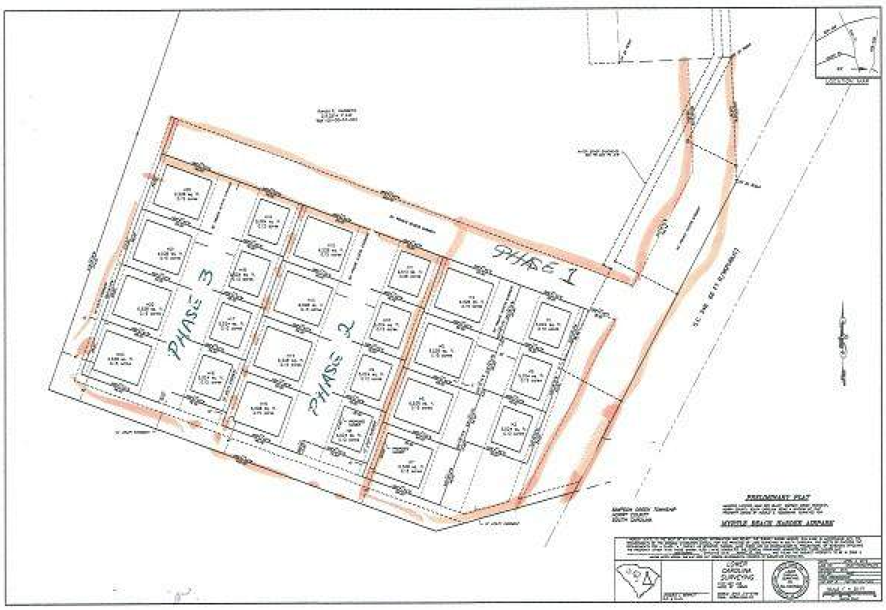


Fuel shut off selector on aircraft

Master Electrical Shut off

Fire Resistant Wire

Fire Extinguisher in Aircraft



Example layout of small aircraft hangars.

Cost Impact: The code change proposal will decrease the cost of construction
The exterior walls of detached residential airplane hangars may be slightly less since the fire resistance rating for some construction types would be 0 instead of 1 hour.

G89-21

G90-21

IBC: [F] 412.3.6; IFC: 914.8.3

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

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

2021 International Building Code

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES.

Revise as follows:

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

> **Exception:** Where a *fixed base operator* has separate repair facilities on site, Group II hangars operated by a *fixed base operator* used for storage of *transient aircraft* only shall have ~~a~~ an automatic fire sprinkler ~~suppression~~ system, ~~but the system~~ and is exempt from foam requirements provided the system is designed in accordance with Section 903.3.1.1 with a minimum sprinkler design density of 0.2 gpm over 5,000 ft.^{2} (465 m^2).

2021 International Fire Code

Revise as follows:

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

> **Exception:** Where a fixed base operator has separate repair facilities on-site, Group II hangars operated by a fixed base operator used for storage of transient aircraft only shall have ~~a~~ an automatic fire sprinkler ~~suppression~~ system, ~~but the system shall be~~ and is exempt from foam requirements provided the system is designed in accordance with Section 903.3.1.1 with a minimum sprinkler design density of 0.2 gpm over 5,000 ft.^{2} (465 m^2)

.

Reason Statement: Group II hangars in NFPA 409 are protected with a combination of fire sprinkler and foam systems. The current exception in the IBC allows the foam system to be removed without any direction from NFPA 409 protection to do so. It is easily misinterpreted reading NFPA 409, Section 7.2.5 to permit a fire sprinkler system density of 0.17 gpm over 5,000 sq ft. however, this density is applied with a foam system.

Cost Impact: The code change proposal will decrease the cost of construction
This is an option and a clarification, so there is no change to the required sprinkler system.

G90-21

G91-21

IBC: [F] 415.11.1.1.2

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

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

2021 International Building Code

[F] 415.11 Group H-5. In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.11.1 through 415.11.12 and the *International Fire Code*.

Delete without substitution:

~~**[F] 415.11.1.1.2 Hazardous production materials.** The maximum quantities of hazardous production materials (HPM) stored in a single *fabrication area* shall not exceed the maximum allowable quantities per *control area* established by Table 307.1(1) and Table 307.1(2).~~

Reason Statement: Although this section of the IBC is under the jurisdiction of the Fire Code Committee, the section is not consistent with the IFC. A section equivalent to Section 415.11.1.1.2 does not exist in the IFC. As fabrication areas increase in size, the current Section 415.11.1.1.2 is overly restrictive and compliance becomes impractical. Furthermore, the section only applies when a facility is considered a Use Group H so applying the MAQ limits would not be appropriate.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This resolves a conflict between the IBC and IFC. If the IBC requirements are applied, the proposal has the impact of reducing the cost of construction.

G91-21

G92-21

IBC: 415.11.1.5.1 (New)

Proponents: William Koffel, representing Semiconductor Industry Association (wkoffel@koffel.com)

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

2021 International Building Code

SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5.

[F] 415.11 Group H-5. In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.11.1 through 415.11.12 and the *International Fire Code*.

[F] 415.11.1.5 Shafts and openings through floors. Elevator hoistways, vent *shafts* and other openings through floors shall be enclosed where required by Sections 712 and 713. Mechanical, duct and piping penetrations within a *fabrication area* shall not extend through more than two floors. The *annular space* around penetrations for cables, cable trays, tubing, piping, conduit or ducts shall be sealed at the floor level to restrict the movement of air. The *fabrication area*, including the areas through which the ductwork and piping extend, shall be considered to be a single conditioned environment.

Add new text as follows:

415.11.1.5.1 Quantity Limits. The use and storage quantity limits for hazardous materials and hazardous production materials (HPMs) for connected levels shall be aggregated based upon the overall area. The quantity in any single area shall not exceed limits stipulated in Table 415.11.1.1.1 for a single fabrication area in Group H-5.

Reason Statement: The Code is not clear how to apply the quantity limits when multiple levels of a fabrication area are connected. The proposed language allows for the areas on the different levels to be aggregated but the limits within any single area shall not exceed the requirements of Table 415.11.1.1.1. In other words, one cannot use the aggregated area to allow a higher concentration in any single area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language as been approved by the SIA Codes Committee and represents how the current code is being applied. As such, there should be no impact on the cost of construction.

G92-21

G93-21

IBC: TABLE 414.5.1, TABLE 415.6.5; IFC: TABLE 911.1, TABLE 5003.8.2

Proponents: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com)

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

2021 International Building Code

Revise as follows:

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a, h]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems[b]**
HAZARD CATEGORY			
Combustible dusts[c]	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4[i]	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA[d]	Not Required	Required
	IB[e]	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2[g]	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Electrochemical energy storage system[i]	—	Not Required	Required
Energy storage system[i]	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist[f]	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *International Fire Code*.

c. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.

d. Storage or use.

e. In open use or dispensing.

f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.

i. Where explosion control is required in Section 1207 of the *International Fire Code*.

j. <u>Does not apply to consumer fireworks, 1.4G.</u>

[F] TABLE 415.6.5
DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHERE THE QUANTITY OF MATERIAL EXCEEDS THAT SPECIFIED HEREIN			
Material	**Class**	**Solids and Liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1	Maximum Allowable Quantity	Not Applicable
	Division 1.2	Maximum Allowable Quantity	
	Division 1.3	Maximum Allowable Quantity	
	Division 1.4[e]	Maximum Allowable Quantity	
	Division 1.4[c, e]	1	
	Division 1.5	Maximum Allowable Quantity	
	Division 1.6	Maximum Allowable Quantity	
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3	1,200	Not Applicable
	Class 2	2,000	Not Applicable
Organic peroxides	Detonable	Maximum Allowable Quantity	Not Applicable
	Class I	Maximum Allowable Quantity	Not Applicable
	Class II	25	Not Applicable
	Class III	50	Not Applicable
Unstable (reactives) nondetonable	Class 3	1	2,000
	Class 2	25	10,000
Water reactives	Class 3	1	Not Applicable
	Class 2	25	Not Applicable
Pyrophoric gases[d]	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of this code or Chapter 56 of the International Fire Code based on trinitrotoluene (TNT) equivalence of the material, whichever is greater.

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 307.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, provided that the net explosive weight of individual articles does not exceed 1 pound.

d. Detached buildings are not required, for gases in gas rooms that support H-5 fabrication facilities where the gas room is separated from other areas by a fire barrier with a fire-resistance rating of not less than 2 hours and the gas is located in a gas cabinet that is internally sprinklered, equipped with continuous leak detection, automatic shutdown and is not manifolded upstream of pressure controls. Additionally, the gas supply is limited to cylinders that do not exceed 125 pounds (57 kg) water capacity in accordance with 49 CFR 173.192 for Hazard Zone A toxic gases.

e. Does not apply to consumer fireworks, 1.4G.

2021 International Fire Code

Revise as follows:

TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS[f]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
Hazard Category			
Combustible dusts[a]	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4[i]	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA[b]	Not required	Required
	IB[c]	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2[e]	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Electrochemical energy storage systems[g]	—	Not required	Required
Energy storage systems[g]	—	Not required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist[d]	Detonation	Required	Not permitted
	Deflagration	Not required	Required

a. Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2. See definition of “Combustible dust” in Chapter 2.

b. Storage or use.

c. In open use or dispensing.

d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.

g. Where explosion control is required in Section 1207.6.3.

j. .Does not apply to consumer fireworks, 1.4G.

TABLE 5003.8.2
DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHERE THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN			
Material	**Class**	**Solids and liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4[e] Division 1.4[c,e] Division 1.5 Division 1.6	Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity 1 Maximum Allowable Quantity Maximum Allowable Quantity	Not Applicable
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3 Class 2	1,200 2,000	Not Applicable
Organic peroxides	Detonable Class I Class II Class III	Maximum Allowable Quantity Maximum Allowable Quantity 25 50	Not Applicable
Unstable (reactives) nondetonable	Class 3 Class 2	125	2,000 10,000
Water reactives	Class 3 Class 2	125	Not Applicable
Pyrophoric gases[d]	Not Applicable	Not Applicable	2,000

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 m^3, 1 ton = 2000 lb = 907.2 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of the International Building Code or Chapter 56 based on the trinitrotoluene (TNT) equivalence of the material, whichever is greater.

b. “Maximum Allowable Quantity” means the maximum allowable quantity per control area set forth in Table 5003.1.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

d. Detached buildings are not required for gases in gas rooms that support H-5 fabrication facilities where the gas room is separated from other areas by a fire barrier with a fire-resistance rating of not less than 2 hours and the gas is located in a gas cabinet that is internally sprinklered, equipped with continuous leak detection, automatic shutdown, and is not manifolded upstream of pressure controls. The gas supply is limited to cylinders that do not exceed 125 pounds water capacity in accordance with DOTn 49 CFR 173.192 for Hazard Zone A toxic gases.

e Does not apply to consumer fireworks, 1.4G.

Reason Statement: The proposal addresses an unanticipated consequence associated with Code Change F347-16
The 2015 Editions of the I-Codes contain the following definitions for “Fireworks, 1.4G” and for “Explosives, Division 1.4”:

Fireworks, 1.4G. *Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion. Such 1.4G fireworks which comply with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN0336, and the U.S. Consumer Product Safety Commission (CPSC) as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive materials for the purpose of this code.*

Explosive, Division 1.4. *Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.*

While the IBC and IFC contain a definition for “Explosive”, there is a difference between the two definitions. Within the definition of “Explosive” in the 2018 Edition of the IBC, the following language continued to appear:

The term “explosive” includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified *as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.*

Code Change F347-16 proposed several changes one of which was the deletion of ", are not explosive materials for the purpose of this code." The submitter indicated that the change should have no impact as noted in the following portion of the Reason statement:

The change to Table 5603.1.1(1) is a change to reflect that consumer fireworks are indeed properly classified as an Explosive 1.4G and it's not necessary to have a separate line with identical threshold values, including all footnotes, in order to determine at what point a building would be or should be classified as a Group H-3. It's redundancy within the same table. In reality, at least at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of the change to Table 5603.1.1(1) will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sale and use.

The cost analysis for the code change contains similar language that Code Change F347-16 should have no impact by stating:

Cost Impact: *Will not increase the cost of construction.*

The documentation associated with Code Change F347-16 indicated that the change would not impact the world of consumer fireworks. However, the two tables in the IBC are being applied to now require a detached building and explosion control for storage facilities containing consumer fireworks, 1.4G. Prior to the changes associated with F347-16 such protection was not required. There is on documentation indicating that storage facilities containing consumer fireworks, 1.4G need either explosion control or to be detached buildings.

Cost Impact: The code change proposal will decrease the cost of construction
Based on the way the 2021 Edition of the IBC is being interpreted, the cost of construction will be decreased. For those jurisdictions using the 2015 Edition, or earlier, of the IBC, there is no impact on the cost of construction.

G93-21

G94-21

IBC: SECTION 202, 423.1, 423.3.1, 423.5.1

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Marc Levitan, representing ICC 500 Storm Shelter Standard Committee (marc.levitan@nist.gov)

2021 International Building Code

Revise as follows:

[BG] STORM SHELTER. A building, structure or portions thereof, constructed in accordance with ICC 500 and designated for use during ~~a severe wind storm event, such as a hurricane or tornado~~ hurricanes, tornadoes or other severe windstorms.

SECTION 423 STORM SHELTERS.

Revise as follows:

423.1 General. This section applies to the design and construction of storm shelters constructed as separate detached buildings or constructed as rooms or spaces within buildings for the purpose of providing protection from ~~storms that produce high winds, such as~~ tornadoes , ~~and~~ hurricanes~~,~~ and other severe windstorms during the storm. This section specifies where *storm shelters* are required and provides requirements for the design and construction of *storm shelters*. Design of facilities for use as emergency shelters after the storm are outside the scope of ICC 500 and shall comply with Table 1604.5 as a *Risk Category* IV Structure.

423.3.1 Dedicated storm shelters. A facility designed to be occupied solely as a *storm shelter* shall be classified as Group A-3 for the determination of requirements other than those covered in ICC 500.

Exceptions:

1. The occupancy category for dedicated *storm shelters* with ~~an~~ a design *occupant* ~~*load*~~ capacity of ~~fewer~~ less than 50 persons as determined in accordance with ICC 500 shall be in accordance with Section 303.
2. The occupancy category for a dedicated residential *storm shelter* shall be the Group R occupancy served.

423.5.1 ~~Required~~ Design occupant capacity. The required design occupant capacity of the *storm shelter* shall include all of the buildings on the site and shall be the greater of the following:

1. The total *occupant load* of the classrooms, vocational rooms and offices in the Group E occupancy.
2. The *occupant load* of the largest indoor assembly space that is associated with the Group E occupancy.

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required design occupant capacity of the *storm shelter* for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the *building official,* the required design occupant capacity of the shelter shall be permitted to be reduced by the design occupant capacity of any existing *storm shelters* on the site.

Reason Statement: ICC 500, a current reference standard in the IBC, IRC and IEBC, was recently updated to a 2020 edition for reference in the 2021 I-Codes. The new edition made some minor revisions to terminology differences that need to be reflected in the corresponding IBC Section 423 language. The key changes are as follows:

- Refer consistently to “tornadoes, hurricanes and other severe windstorms” to reflect that extratropical events are called hurricanes, typhoons or cyclones depending on region.
- Replace “occupant load” with design occupant capacity” to reflect ICC-500’s unique calculation of shelter capacity, which is different from the occupant load used in the IBC to size means of egress.
- Clarifying the term “community shelters” includes those shelters open to the general public, those open only to the occupants of the building served by the shelter, or both.

A corresponding proposal will be submitted in Group B to update Section R323 of the IRC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and the ICC 500 Development Committee.

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

The ICC 500 (Standard for the Design and Construction of Storm Shelters) development committee has held several virtual meetings during the last two years to develop the 202) edition. In addition, there were numerous virtual Working Group meetings. All meetings included members of the committee as well as interested parties. Related documents and reports are posted on the ICC 500 website at ICC 500.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The changes are editorial and necessary for correlation with ICC-500. They do not impact the way storm shelters are designed and constructed.

G94-21

G95-21

IBC: 423.4.1 (New)

Proponents: Benchmark Harris, representing National Storm Shelter Association (bharris@huckabee-inc.com)

2021 International Building Code

423.4 Critical emergency operations. In areas where the shelter design wind speed for tornados in accordance with Figure 304.2(1) of ICC 500 is 250 mph, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall comply with Table 1604.5 as a *Risk Category* IV structure and shall be provided with a *storm shelter* constructed in accordance with ICC 500.

Add new text as follows:

423.4.1 Location. Storm shelters shall be located within the building they serve or shall be located where the maximum distance of travel from not fewer than one exterior door of each building to a door of the shelter serving that building does not exceed 1,000 feet (305 m).

Reason Statement: There currently are no criteria limiting the travel distance to storm shelters for critical emergency operations facilities. Last code cycle, NSSA proposed that the travel distance provision be deleted entirely from the E occupancy requirements for storm shelters in the IBC but it was rejected. A similar motion was approved in the IEBC, though. The intent of this proposal is to apply the same travel distance requirements in the IBC to critical emergency operations center storm shelters as for E occupancy storm shelters. So, this proposal follows the requirements for travel distance of Group E occupancies.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction on some projects (where a campus has multiple buildings far apart) by requiring critical emergency operations centers have the same travel distance requirement that E occupancy areas do. In cases, this will require multiple storm shelters as it does for E occupancy facilities.

G95-21

G96-21

IBC: 423.4.1 (New)

Proponents: Benchmark Harris, representing National Storm Shelter Association (bharris@huckabee-inc.com)

2021 International Building Code

423.4 Critical emergency operations. In areas where the shelter design wind speed for tornados in accordance with Figure 304.2(1) of ICC 500 is 250 mph, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall comply with Table 1604.5 as a *Risk Category* IV structure and shall be provided with a *storm shelter* constructed in accordance with ICC 500.

Add new text as follows:

423.4.1 Required Occupant Capacity. The required occupant capacity of the storm shelter shall include all of the buildings on the site and shall be the greater of the following:

1. The total occupant load of offices.
2. The occupant load of the largest indoor assembly space.

Exceptions:

1. Where a new building is being added on an existing site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the storm shelter for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity of the new building.
2. Where approved by the building official, the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing storm shelters on the site.

Reason Statement: There are currently no minimum requirements for occupant capacity of a storm shelter for 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations. This proposal follows the requirements for occupant load of Group E occupancies. This proposal would give a basis of design for storm shelters to set a minimum size standard for designers to start the design of the storm shelter.
NSSA submitted a change to the IBC last cycle that was rejected but would have eliminated the Assembly area criteria for E occupancy areas. A similar motion was approved at the IEBC, however. This change would provide consistency with the E occupancy area provisions in the IBC.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction because it will require storm shelters be designed for the largest indoor assembly area on a site. This could include a City Hall Assembly Area, for example, but this would make the provision consistent with the requirements for E occupancy areas, as the IBC requires schools design for the largest indoor assembly areas even if it's a large and open performing arts area open to the public, unrelated to education, with a capacity much larger than the largest expected student population on a regular school day.

G96-21

G97-21

IBC: 423.5.1

Proponents: CRAIG MCKEE, representing Huckabee, Inc (cmckee@huckabee-inc.com)

2021 International Building Code

Revise as follows:

423.5.1 Required occupant capacity. The required occupant capacity of the *storm shelter* shall include all of the buildings on the site and shall be the ~~greater of the following:~~

1. ~~The~~ total *occupant load* of the classrooms, vocational rooms and offices in the Group E occupancy.
2. ~~The *occupant load* of the largest indoor assembly space that is associated with the Group E occupancy.~~

Exceptions:

1. Where a new building is being added on an existing Group E site, and where the new building is not of sufficient size to accommodate the required occupant capacity of the *storm shelter* for all of the buildings on the site, the storm shelter shall at a minimum accommodate the required occupant capacity for the new building.
2. Where approved by the *building official,* the required occupant capacity of the shelter shall be permitted to be reduced by the occupant capacity of any existing *storm shelters* on the site.

Reason Statement: For the same reason that the code does not require shelters for the entire population that outdoor venues can accommodate, such as outdoor football fields, it should not be necessary for schools to increase the size of the shelters for criteria 2. It is common for schools to share sites with other buildings that have indoor assembly areas that many building officials conservatively consider to be associated with a Group E occupancy. These assembly areas are often on the same site as the school and are sometimes even used by students during the school day, but these assembly areas do not add to the normal population of students in school and the staff that are associated with those students. Many school communities can understand and support the unfunded mandate in tornado prone areas that schools bear the cost of providing tornado shelters for minors that are required by law to be in the care of a school and those adult individuals taking care of them, out of an elevated obligation that comes with having school be mandatory for minors in our country. However, it is inappropriate to require that school systems bear the cost of sheltering possible occupants from the public at these areas. The population for criteria 2 can be significantly larger than criteria 1 when there are large assembly spaces on the site such as a public library (e.g. when a public library operates on a school campus and also functions as the school library), indoor football field, performing arts center, equestrian arena, natatorium, competition basketball arena, and/or professional development center.
The additional people in question (above and beyond criteria 1) elect to be in those assembly areas (as adults, or as minors before or after normal school hours at the permission of their parents/guardians), just like they do in any commercial or other public assembly area. If ICC believed that the public in all assembly areas needed to be sheltered because the tornado hazards are that significant in those areas, then those types of businesses should be required to build tornado shelters too. The current code places an inequitable financial burden on school districts. More importantly, though, the additional area of shelter will most likely never be used.

Yes, if a tornado with windspeeds greater than the main building was designed to withstand happens to occur at the exact moment that there is an assembly with more people than the criteria 1 population, the additional area of the shelter could be used. However, there is a very low probability of this occurring and, other than this occurrence, the additional area of shelter would typically never be used because school districts that are constructing code-required shelters (not FEMA funded safe rooms) typically have no intention of ever opening their tornado shelters up to the general public because of the many operational challenges (e.g. concern with overcrowding above the shelter capacity) and increased liability.

This issue is further complicated by the fact that Section 432.5.2 requires storm shelters be within 1,000 feet of the buildings they serve. Many high school campuses have buildings with Assembly functions (that building officials conservatively consider to be associated with an E occupancy) greater than 1,000 feet from the school building. The code is not clear whether these assembly areas require their own tornado shelter. Removing criteria 2 would resolve this dilemma by clearly identifying that the occupant load of the classrooms, vocational areas and offices are the areas that need to be served with tornado shelters.

The rationale to remove criteria 2 applies to new campuses as well as existing campuses; however, it is especially applicable for new buildings on existing campuses where options to provide a tornado shelter are much more limited because the existing buildings were not laid out with a future tornado shelter in mind.

The following is an example:

There is an existing performing arts center on a 100 Acre site, with the two buildings more than 1,000 feet apart, and the 2021 IBC is in effect. The school system proposes a new academic building with a criteria 1 population of 2,000. The criteria 1 population of the performing arts center is 0. The Building Official considers the performing arts center to be an A that is associated with an E occupancy. There are moveable partitions in the performing arts center that allow all of the rooms (except for the lobby) to open up into one large performing arena for 5,000 people in seats and up to 500 people on stage, making the criteria 2 population (the largest indoor assembly area associated with the E occupancy on the site) 5,500 people. The school system is required to build a shelter for at least 5,500 people because the floor plan area of the proposed addition to the academy could accommodate 5,500 people if the entire addition was one large tornado shelter. If the two buildings were closer than 1,000 feet, the 2021 IBC criteria 2 would require $10 Million of sheltering ($5.6 Million for the 2,000 people in a multi-purpose shelter and $4.4 Million for 3,500 people in a dedicated, single-use shelter). This means that even in the 1,000 feet proximity rule was not in effect, this school system would need to spend $4.4 Million on sheltering the additional population that could be in a performing arts center. However, because the buildings are more than 1,000 feet apart, the actual cost impact of criteria 2 is much greater at this campus because 2 separate shelters are required to accommodate the travel distance requirement. 2021 IBC section 432.5.2 requires that the shelters be located within 1,000 feet of the “population they serve” and these two buildings are more than 1,000 feet apart. Therefore, the code requires that a 5,500 person shelter be constructed as a new addition to the performing arts center to accommodate that population and a 2,000 person shelter be constructed as part of the proposed academic building. The combined cost of these two shelters would be $12.5 Million ($5.6 Million for the 2,000 people in the multi-purpose shelter by the academy and $6.9 Million for 5,500 people in a dedicated, single-use shelter by the performing arts center). Without criteria 2, only a $5.6 Million shelter would be required for the 2,000 occupants associated with criteria 1 on the entire campus.

Cost Impact: The code change proposal will decrease the cost of construction
There will be a decrease in the cost for storm shelters for new school buildings on existing campuses that have associated assembly spaces larger than the student population.

G97-21

G98-21

IBC: 423.5.2

Proponents: CRAIG MCKEE, representing Huckabee, Inc (cmckee@huckabee-inc.com)

2021 International Building Code

Revise as follows:

423.5.2 Location. Storm shelters shall be located within the buildings they serve or shall be located where the maximum distance of travel from not fewer than one exterior door of each building to a door of the shelter serving that building does not exceed 1,000 feet (305 m), unless otherwise approved.

Reason Statement: While 1,000 feet maximum travel may be appropriate for new schools on new campuses, this can be an undue hardship for new buildings on existing campuses. Where a new building is located on an existing campus may be limited by a variety of building and site constraints.
Good disaster management practices will typically give schools a response time long enough to be able to move students to on-site shelters.

And, good management of a storm shelter is often better when there is 1 location instead of many smaller tornado shelters. For example, it's possible to overcrowd a tornado shelter when there are multiple shelters onsite and it is not clear which shelter has room available, unless all tornado shelters are designed to accomodate the entire population of the campus which would be a significant, redundant cost. Furthermore, emergency rescue is greatly assisted when there are a fewer number of tornado shelters for people to be rescued from.

An example of how the current provision can create a significant and unnecessary financial impact at a campus: A large, existing community college with 25 buildings throughout an approximately 200 Acre campus. A new building is proposed in the middle of the campus for high school students that want to earn early college credit, making this building a Group E building. The 25 existing buildings have assembly spaces that are considered an accessory to the Group E occupancy because they can be used by the high school students. The campus wants to build a large addition to the early college learning building for high school students, one that is large enough to accommodate the population required by Section 423.5.1. However, there are indoor assembly spaces that are spread throughout the entire campus, much greater than 1,000 feet, requiring that multiple new tornado shelters be constructed for the assembly spaces that are accessory to a Group E occupancy. Tornado Shelters are not required for college campus classrooms, which are Group B. It is an unnecessary burden to require a community college campus construct multiple tornado shelters throughout their campuses when there are emergency planning alternatives. The community college can manage the high school student population by directing those students to their designated shelters at early signs of an approaching storm, even though some students may be in a building farther than 1,000 feet from the shelter when a tornado approaches.

Cost Impact: The code change proposal will decrease the cost of construction
Removing the requirement for a maximum 1,000 foot travel distance avoids constructing multiple tornado shelters at large campuses, instead of one.

G98-21

G99-21 Part I

PART I - IBC: SECTION 202 (New)
PART II - IBC: SECTION 429 (New), NFPA Chapter 35 (New)
PART III - IBC:306.3
PART IV - IBC:311.3
PART V - IBC:TABLE 509.1
PART VI - IBC:TABLE 1004.5, 1004.8 (IFC[BE] TABLE 1004.5, 1004.8)
PART VII - IBC:1010.2.9.1(IFC[BE] 1010.2.9.1)
PART VIII - IFC: SECTION 202 (New)
PART IX- IFC: SETION 608.9.1
PART X - IMC: SECTION 202 (New)
PART XI - IMC: 1103.2
PART XII - IMC: 1104.2.3 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

THIS IS A 12 PART CODE CHANGE. PART I THROUGH V WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART VI AND VII WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART VIII AND IX WILL BE HEARD BY THE FIRE CODE COMMITTEE.PART X AND XII WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment* (ITE) and serving an ITE load less than or equal to10 kW or 20 W/ft^2 (215 W/m^2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment* (ITE) and serving a total ITE load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part I

G99-21 Part II

PART II - IBC: SECTION 429 (New), NFPA Chapter 35 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Add new text as follows:

SECTION 429 INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF).

429.1 General. *Information technology equipment facilities* (ITEF) shall be classified as industrial occupancies in accordance with Section 1103 of the *International Mechanical Code* and shall comply with Sections 429.1 through 429.9.

429.2 Refrigerants. Refrigerants used to cool ITE processes shall be limited to Groups A1 and A2L except where *approved*.

429.3 Fire Protection. ITEF shall comply with NFPA 75.

429.4 Design and construction. ITEF shall comply with Sections 429.4.1 and 429.4.2.

429.4.1 Separation. ITEF shall be separated from other occupancies by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

> **Exception:** Computer rooms less than 500 square feet (46 m^2) in area in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

429.4.2 Combustible materials in concealed spaces. Other than combustible materials permitted for exposed use within plenums complying with Section 602 of the International Mechanical Code, combustible materials shall not be permitted in concealed spaces of ITEF.

429.5 Electrical. All electrical equipment other than *information technology equipment* shall conform to Class 1, Division 2, of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the *lower flammability limit* (LFL) upon release to the space.

429.6 Ventilation. Ventilation in ITE spaces shall be activated by refrigerant detection systems in accordance with of Chapter 11 of the *International Mechanical Code. Recirculated air* sufficient to fully disperse refrigerant within the ITE space without supply or exhaust air complies with this requirement.

429.7 Refrigerant detection. ITEF shall be provided with refrigerant detection that complies with Sections 429.7.1 and 429.7.2, and Section 608.9 of the *International Fire Code*.

429.7.1 System activation. Activation of a refrigerant gas detection alarm shall result in the following:

1. Initiation of distinct audible and visible alarm signals both inside and outside of the ITEF.
2. Automatic activation of the mechanical ventilation system.

429.7.2 Failure of the refrigerant detection system. Failure of the refrigerant detection system shall automatically activate the mechanical ventilation system and cause a trouble signal to sound at an approved location.

429.8 Standby power. Mechanical ventilation and refrigerant detection systems shall be provided with a *standby power system* in accordance with Section 2702.

429.9 Common path of egress travel. ITEF shall comply with Section 1006.2.2.3.

Add new standard(s) as follows:

NFPA

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

NFPA 75-2020: Standard for the Fire Protection of Information Technology Equipment

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part III

PART III - IBC:306.3

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

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

- Beverages: up to and including 16-percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- *Information technology equipment facilities*
- Metal products (fabrication and assembly)

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part III

G99-21 Part IV

PART IV - IBC:311.3

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings housing information technology equipment facilities, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including 16-percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Information technology equipment facilities
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part IV

G99-21 Part V

PART V - IBC:TABLE 509.1

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

TABLE 509.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Information Technology Equipment Facilities	1 hour or provide automatic fire-extiguishing system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part V

G99-21 Part VI

PART VI - IBC:TABLE 1004.5, 1004.8 (IFC[BE] TABLE 1004.5, 1004.8)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

Portions of table not shown remain unchanged.

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Business areas	150 gross
Information Technology Equipment Facilities	300 gross
Concentrated business use areas	See Section 1004.8

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

a. Floor area in square feet per occupant.

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

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part VI

G99-21 Part VII

PART VII - IBC:1010.2.9.1(IFC[BE] 1010.2.9.1)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Building Code

Revise as follows:

1010.2.9.1 Refrigeration machinery room. Refrigeration machinery rooms <u>and information technology equipment facilities</u> larger than 1,000 square feet (93 m^2) shall have not less than two exit or exit access doorways that swing in the direction of egress travel and shall be equipped with *panic hardware* or *fire exit hardware*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part VII

G99-21 Part VIII

PART VIII - IFC: SECTION 202 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Fire Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment (ITE)* and serving an *ITE* load less than or equal to10 kW or 20 W/ft2 (215 W/m2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment (ITE)* and serving a total *ITE* load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part VIII

G99-21 Part IX

PART IX- IFC: SECTION 608.9.1

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Fire Code

Revise as follows:

608.9.1 Refrigerants other than ammonia. A detector, or a sampling tube that draws air to a detector, shall be provided at an *approved* location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an *approved* location where the concentration of refrigerant detected exceeds the lesser of the following:

1. The corresponding TLV-TWA values shown in the *International Mechanical Code* for the refrigerant classification.
2. Twenty-five percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.

Exception: Automatic shut off shall not be required for refrigeration equipment in *information technology equipment facilities* that comply with Section 429 of the *International Building Code* and Section 1104.2.2.3 of the *International Mechanical Code*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part IX

G99-21 Part X

PART X - IMC: SECTION 202 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Add new definition as follows:

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment (ITE)* and serving an *ITE* load less than or equal to10 kW or 20 W/ft^2 (215 W/m^2) or less of conditioned floor area.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment (ITE)* and serving a total *ITE* load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment.*

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part X

G99-21 Part XI

PART XI - IMC: 1103.2

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Revise as follows:

1103.2 Occupancy classification. Locations of refrigerating systems are described by *occupancy* classifications that consider the ability of people to respond to potential exposure to refrigerants. Where *equipment* or *appliances*, other than piping, are located outside a building and within 20 feet (6096 mm) of any building opening, such *equipment* or *appliances* shall be governed by the *occupancy* classification of the building. *Occupancy* classifications shall be defined as follows:

1. Institutional *occupancy* is that portion of premises from which occupants cannot readily leave without the assistance of others because they are disabled, debilitated or confined. Institutional occupancies include, among others, hospitals, nursing homes, asylums and spaces containing locked cells.
2. Public assembly *occupancy* is that portion of premises where large numbers of people congregate and from which occupants cannot quickly vacate the space. Public assembly occupancies include, among others, auditoriums, ballrooms, classrooms, passenger depots, restaurants and theaters.
3. Residential *occupancy* is that portion of premises that provides the occupants with complete independent living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation. Residential occupancies include, among others, dormitories, hotels, multiunit apartments and private residences.
4. Commercial *occupancy* is that portion of premises where people transact business, receive personal service or purchase food and other goods. Commercial occupancies include, among others, office and professional buildings, markets (but not large mercantile occupancies) and work or storage areas that do not qualify as industrial occupancies.
5. Large mercantile *occupancy* is that portion of premises where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.
6. Industrial *occupancy* is that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to house *information technology equipment* such as *computer rooms* or *data centers* or for the manufacture, ~~process~~ processing or ~~store~~ storage of goods such as chemicals, food, ice, meat or petroleum.
7. Mixed *occupancy* occurs where two or more occupancies are located within the same building. Where each *occupancy* is isolated from the rest of the building by tight walls, floors and ceilings and by self-closing doors, the requirements for each *occupancy* shall apply to its portion of the building. Where the various occupancies are not so isolated, the *occupancy* having the most stringent requirements shall be the governing *occupancy*.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G99-21 Part XI

G99-21 Part XII

PART XII - IMC: 1104.2.3 (New)

Proponents: Greg Johnson, representing Codes & Standards International (gjohnsonconsulting@gmail.com); Jay Peters, representing Vertiv (peters.jay@me.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Barry Greive, Target Corporation, representing Target Corporation (barry.greive@target.com); David Collins, representing The Preview Group, Inc. (dcollins@preview-group.com); Lee Kaiser, ORR Protection, representing NFPA 75 Technical Committee (ELT-AAA) (lkaiser@orrprotection.com)

2021 International Mechanical Code

Add new text as follows:

1104.2.3 Industrial occupancies and information technology equipment facilities.
This section applies only to industrial occupancies classified as *information technology equipment facilities* that comply with Section 429 of the *International Building Code*. Where a machinery room would otherwise be required by Section 1104.2, a machinery room shall not be required where all of the following conditions are met:

1. Refrigerants used to cool *ITE* processes are limited to Groups A1 and A2L except where approved.
2. The space containing the *ITE* processes is separated from other occupancies in accordance with Section 429 of the *International Building Code*.
3. Access is restricted to authorized personnel.
4. Where other than Group A1 refrigerants are used, refrigerant detectors are installed as required in accordance with Section 608.9 of the *International Fire Code* for machinery rooms except that any stoppage of refrigeration equipment shall be by manual means.
5. All electrical equipment other than *information technology equipment* shall conform to Class 1, Division 2, of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 75-20, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: General information -

This is several proposals across multiple codes and standards to propose requirements appropriate to the unique characteristics of facilities housing computer rooms and data centers or *Information technology equipment* (ITE).Computer rooms and data centers are mission critical applications. All aspects of our public infrastructure, transportation, our education system, our healthcare system, our national defense, our banking, our public safety systems, our process for writing codes - our lives - are wholly dependent on the efficient real-time processing of data. The ITE used to perform this function must be 100% reliable.
For these reasons ITE facilities are secured spaces, atmospherically and physically, with tightly controlled access.

Because access to ITE facilities is restricted, and because ITE facilities are only accessed by technicians performing periodic process maintenance, the occupant load of these spaces is intermittent or sparse.

Like many process industries, ITE facilities have specific environmental process constraints if they are to function properly:

- ITE needs to be continuously cooled to protect the data and sometimes the best way to cool the equipment is to cool the room.
- ITE is extremely sensitive to humidity and atmospheric contaminants; it can ruin equipment and thereby data. Ideally, ITE facilities bring in no outside air or moisture into ITE spaces; ventilation for refrigerants within ITE facilities is solely to reduce refrigerant concentration by fully mixing refrigerant into the atmosphere of the space.
- Alternative methods of fire suppression may be most suitable.

Until recently ITE facilities used nonflammable A1 refrigerants, but separate rule makings by the California Air Resources Board and the US Environmental Protection Agency now require refrigerants to meet Global Warming Potential (GWP) values that are much lower than currently possible with commercially available A1 refrigerants.

For this reason the ITE facilities cooling industry is adopting the use of A2L refrigerants which perform well, which are environmentally friendlier and which have much lower GWP values, but which are mildly flammable.

Adoption of A2L refrigerant necessitates ITE facility code requirements that provide the right protection for the unique industrial process being protected.

Requirements addressing ITE facilities must be flexible and performance oriented to address the many potential configurations of these spaces, from small computer rooms within much larger uses, or as one use in multiple occupancies, to unlimited area data centers that occupy millions of square feet of land, (https://www.analyticsvidhya.com/blog/2020/09/8-largest-data-centers-world-2020/).

PART I - IBC DEFINITIONS

Using common definitions for information technology equipment, data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*. They are consistent with definitions used in the ASHRAE 90.4 *Energy Standard for Data Centers* as well as NFPA 75 *Standard for the Fire Protection of Information Technology Equipment*. It is likely that the definitions of data centers and computer rooms will be added to future editions of the IECC.The definitions for computer rooms and data centers are based ASHRAE Standard 90.4-2019 *Energy Standard for Data Centers* except that the definition of computer rooms was modified to clarify that computer rooms are not primarily used for any other purpose than to house *information technology equipment*. This modification is necessary to distinguish computer rooms (data processing) from rooms where occupants use computers (data entry).

PART II -IBC Section 429 (New)

See the general reason.

NFPA 75, *The Standard for the Protection of Information Technology Equipment* is proposed as the appropriate reference to assure:

- The need for appropriate fire protection is met regardless of the configuration of the ITE facility.
- The fire protection package appropriately considers the unique environmental needs of the ITE facility.

NFPA 75 benefits from the involvement of subject matter experts in the design, operation and fire protection of these unique industrial processes.

NFPA 75 is realistic and flexible; it requires a documented risk assessment of the ITE facility to serve as the basis for a fire protection approach that is "*permitted to be determined based on an evaluation of fire risks and hazards associated with the* ITE *and services provided and the business continuity planning and disaster restoration capabilities of the* ITE *specific to the* ITE."

NFPA 75 also anticipates that alternative methods of fire suppression may be most suitable to protect data processing capacity and provides references to those NFPA standards that address such systems. It sets forth *"the minimum requirements for the protection of* ITE *equipment and* ITE *areas from damage by fire or its associated effects — namely, smoke, corrosion, heat, and water*."

In addition to the reference to NFPA 75 for performance design provisions, this proposal provides simple prescriptive requirements consistent with the treatment of locations classified as controlled access, industrial occupancies by ASHRAE 15 *Safety Standard for Refrigeration Systems* and the International Mechanical and Fire Codes.

By section, this proposal does the following:

· **Sec. 429.1 General** classifies ITE facilities as industrial occupancies to align with Sec. 1103 of the IMC. Per the IMC, which is consistent with ASHRAE 15, an industrial occupancy is "*that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.*" A change has been proposed for the IMC and to ASHRAE 15 to specifically include ITE facilities in this classification.

· **Sec. 429.2 Refrigerants** limits refrigerants to nonflammable or mildly flammable refrigerants, but also provides clarification that the AHJ can approve other refrigerants on an individual basis.

· **Sec. 429.3 Fire Protection** references NFPA 75.

· **Sec. 429.4 Design and construction** requires a minimum of a one-hour fire separation between the ITE facility and adjacent occupancies, but reasonably provides flexibility for small spaces in fully sprinklered buildings. It also requires materials in concealed spaces, such as below a raised floor or above a suspended ceiling to be those permissible for use in a plenum.

· **Sec. 429.5 Electrical** requires compliance for non-IT equipment with Class 1, Division 2, of NFPA 70 (Class I – Flammable gases or vapors may be present; Division 2 – Ignitable concentrations of hazards exist under abnormal operation conditions) requirements where the code official has approved a refrigerant other than a Group A1 or A2L.

· **Sec. 429.6 Ventilation** requires mechanical ventilation of the ITE space to be triggered by refrigerant detection in accordance with the IMC and its secondary reference to the IFC Sec. 608.9. It also permits required ventilation to mix leaked refrigerant in the ITE space without exhausting the space or bringing in make-up air, thereby protecting the ITE from airborne contaminants and undesirable humidity.

· **Sec. 429.7 Refrigerant detection** references the IFC for refrigerant detection provisions and assures the appropriate initiation of measures to address an unintended leak of refrigerant or failure of the detection system.

· **Sec. 429.8 Standby power** ensures that active detection and protection measures are always available.

· **Sec. 429.9 Common path of egress travel** requires ITEF to comply with the same means of egress requirements as those specified in Section 1006.2.2.3 for refrigerated rooms or spaces. All portions of an ITEF must be within 150 feet of an exit or exit access doorway where such facilities are not protected by an approved automatic sprinkler system.

PART III - IBC Section 306.3 Group F-2

It is proposed to add Information Technology Equipment Facilities (data centers and computer rooms) to the F-2 occupancy group as they are industrial applications not currently addressed by the code with any specificity.

A separate code change proposes to add a section in Chapter 4 to address Information Technology Equipment Facilities (ITEF), but the correct occupancy group should be established.

ITEFs are buildings and spaces that are not open to the public, where access by authorized persons is controlled, and that are used to store and process electronic information or data. They are accessed only by IT maintenance technicians and have low or only intermittent occupant loads

USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new A2L (mildly flammable) refrigerants.

PART IV - IBC Section 311.3 Group S-2

Information technology equipment facilities are unique low hazard and low occupancy uses where data is stored and processed in racked equipment. While there are some moderate hazards specific to ITE facilities under abnormal operational conditions, those hazards are anticipated and mitigated by the codes:

- ITE facilities must be cooled for ITE performance. Potential hazards from flammable refrigerants are managed by compliance with the refrigerant safety provisions of the IMC, the IFC and ASHRAE 15 thereby assuring that leaked flammable refrigerants are detected and managed appropriately.
- IMC Section 1104.2.2 requires that the electrical equipment and appliances in ITE facilities must conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.
- Cabling in underfloor and above ceiling plenum areas of ITE facilities is required to comply with IMC Section 602.2.1.1 and electrical equipment exposed in plenums must comply with IMC Sec. 602.2.1.4.

PART V - IBC Table 509.1 Incidental Uses

Information technology equipment (ITE) facilities -data centers and computer rooms - are cooled for industrial process reasons so that the ITE can operate as needed. This means these facilities can have a significant refrigerant load, just like a refrigerant machinery room, without necessarily having a machinery room. Refrigerant machinery rooms already are identified in Table 509.1 as needing either a one-hour separation or automatic sprinkler system protection. ITE facilities should meet the same standard, except that ITE facilities may need alternative fire protection methods for ITE.

PART VI - IBC Table 1004.5 Occupant Load Factor

The original proponent of Section 1004.8 (Group A, 2015: E9-15) included the section as part of a successful effort to increase the Table 1004.5 occupant load factor (OLF) for the typical business use from 100 to 150 SF gross per occupant. Section 1004.8 was added to ensure that the newly less stringent OLF was not applied inappropriately to business use areas known to have a higher density of occupants.

Data centers and computer rooms do not have a higher density of occupants, but typically have very low or intermittent occupancy loads, being occupied by only IT staff who periodically perform equipment maintenance functions. For this proposal, 300 SF gross OLF was selected as a conservative and appropriate OLF because the footprint of racks of *information technology equipment* are comparable to footprint of the racks of shelving in storage and stock areas of mercantile uses, even though such mercantile areas would be far more frequently occupied.

Data centers and computer rooms have significant cooling needs for process purposes; keeping ITE cool enough is mission critical. USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new refrigerants. Using common definitions for data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*.

PART VII - IBC Section 1010.2.9.2 ITEF exits

Information technology equipment (ITE) facilities (computer rooms and data centers) are cooling intensive spaces because of equipment process needs and have similar exiting concerns to refrigeration machinery rooms because of hazards related to refrigerants.

A separate code change proposal will add ITE facilities (computer rooms and data centers) to the IMC's industrial occupancy classification in recognition of the process cooling needs unique to ITE facilities. This change will permit computer rooms and data centers that comply with new IMC Section 1104.2.3 to have space cooling without requiring a refrigeration machine room per Section 1104.2.2.

PART VIII - IFC Definitions

See the commentary to IBC Definitions above.

PART IX - IFC Section 609.8.1

See the general reason above.

Separate proposals for Chapter 11 of the IMC and Chapter 4 of the IBC apply occupancy specific requirements to ITE facilities. Those proposals:

- limit refrigerants to nonflammable Group A1 and mildly flammable Group A2L refrigerants
- require electrical equipment conformance with the Class I, Division 2, hazardous location classification requirements of NFPA 70, and
- reference NFPA 75, *The Standard for the Protection of Information Technology Equipment* to assure appropriate fire protection is provided regardless of the configuration of the ITE facility and the fire protection package appropriately considers the unique environmental needs of the ITE facility.
- require ITE facilities to be separated from adjacent uses by fire barriers and horizontal assemblies.

Given the other fire safety provisions proposed to apply to ITE facilities, and in recognition that stopping the cooling of an ITE space could jeopardize the data and data processes, automatic stopping of cooling is inadvisable.

Required detection and alarms will inform the facility manager and fire officials of the potential hazard, thereby providing an opportunity for data backup and potential purging of the ITE facility atmosphere.

PART X - IMC Definitions

See the commentary to IBC Definitions above.

PART XI - IMC Occupancy classification.

This proposed change clarifies that data centers and computer rooms, which are cooled solely for the process loads associated with *information technology equipment*, are industrial occupancies.

Per Sec. 1103.2 (6), key features of an industrial occupancy are that it is that portion of a premises that is not open to the public and where access by authorized persons is controlled, both of which are characteristic of data centers and computer rooms.

Industrial occupancies also are defined by the processing of "goods." For data centers and computer rooms the 'goods' being processed is data or electronic information.

It is worth noting that no other occupancy classification specifically addresses any of the characteristics of data centers and computer rooms. The catchall provision in the Commercial occupancy classification for "*work or storage areas that do not qualify as industrial occupancies*," is not appropriate as space cooling in commercial occupancies is intended for comfort cooling, not for process cooling and occupant loads for industrial applications are very low, with restricted access, compared to commercial occupancies that may have no restrictions on access.

Data centers and computer rooms have significant cooling needs for process purposes; keeping ITE cool enough is mission critical.

USEPA and California regulations require transition to lower global warming potential refrigerants, which in turn requires changes in provisions in model codes and standards related to the safe use of new refrigerants. Using common definitions for data centers and computer rooms will foster uniformity of application between codes and related standards. These definitions have been proposed for use by the building, fire, and mechanical codes as well as ASHRAE 15, the *Safety Standard for Refrigeration Systems*.

The definitions for computer rooms and data centers are based upon ASHRAE Standard 90.4-2019 *Energy Standard for Data Centers.*

Appropriately classifying data centers and computer rooms will facilitate the drafting of requirements for the IMC that address the unique circumstances of these occupancies.

PART XII - IMC 1104.2.3 ITEF

See the general reason above.

Currently Sec 1106.3 requires that machinery rooms for Group A2L refrigerants must either conform to Class I, Division 2, hazardous location classification requirements of NFPA 70 **OR** provide provide emergency exhaust ventilation (Sec 1106.4). This proposal allows Group A2L to be used without NFPA 70 compliance and without exhaust ventilation in deference to the ITE environmental needs. A separate proposal to add requirements for ITE facilities in Chapter 4 of the building code clarifies that emergency ventilation for ITE facilities is only required to mix the atmosphere within the ITE space so that leaked refrigerant is fully dispersed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
PART I, VIII and X - The definitions are to information only and will not add any additional construction requirements.
P ART II- In some facilities there may be an additional cost; in others there may be less cost. It will be very building specific.
PART III - This is a clarification.
PART IV- This is a clarification.
PART V - There may additional costs to provide 1 hour separation for the space where the building does not have a fire sprinkler or fire extinguishing system.
PART VI - Means of egress systems will be 'right sized' for data centers and computer rooms.
PART VII - There may be a minimal increase for exit access doors in certain circumstances.

PART IX- Manual controls for refrigeration equipment shut-off should be less expensive than automatic controls.
PART XI -This proposal will match the space use with the correct requirements which will tend to lower construction costs.

PART XII - Having use specific requirements for ITE facilities should minimize costs by avoiding requirements that do not fit the condition.

G99-21 Part XII

G100-21 Part I

PART I- IBC: SECTION 202 (New), 312.1, 429 (New), 429.1 (New), NFPA Chapter 35 (New)
PART II -IFC: SECTION 202 (New), SECTION 202, 322 (New), 322.1 (New), NFPA Chapter 80 (New)
PART III - IPMC: SECTION 202 (New), 310 (New), 310.1 (New), NFPA Chapter 08 (New)

Proponents: Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis . This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

SECTION 429 LIVE FIRE TRAINING BUILDINGS.

429.1 Live fire training buildings. *Live fire training buildings* shall be designed and constructed in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Revise as follows:

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

Agricultural buildings
Aircraft hangars, accessory to a one- or two-family residence (see Section 412.4)
Barns
Carports
Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m^2)
Fences more than 7 feet (2134 mm) in height
Grain silos, accessory to a residential occupancy
Live fire training buildings (see Section 429)
Livestock shelters
Private garages
Retaining walls
Sheds
Stables
Tanks
Towers

Add new text as follows:

NFPA

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

NFPA 1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G100-21 Part I

G100-21 Part II

PART II -IFC: SECTION 202 (New), SECTION 202, 322 (New), 322.1 (New), NFPA Chapter 80 (New)

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis. This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

322 LIVE FIRE TRAINING BUILDINGS.

322.1 Live fire training buildings. *Live fire training buildings* shall be designed, constructed, and maintained in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Add new standard(s) as follows:

NFPA

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

NFPA 1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

G100-21 Part II

G100-21 Part III

PART III - IPMC: SECTION 202 (New), 310 (New), 310.1 (New), NFPA Chapter 08 (New)

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART III WILL BE HEARD BY THE PROPERTY MAINTENANCE/ZONING CODE COMMITTEE.SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Property Maintenance Code

Add new definition as follows:

LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis. This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402, and their associated systems, appliances, and props.

Add new text as follows:

310 LIVE FIRE TRAINING BUILDINGS.

310.1 Live fire training buildings. *Live fire training buildings* shall be maintained in accordance with the applicable provisions of NFPA 1402 and with this code where NFPA 1402 so requires.

Add new standard(s) as follows:

NFPA

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

1402-2019: Standard on Facilities for Fire Training and Associated Props

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1402-2019, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Live fire training facilities contain unique types of buildings/structures that are purposely designed to not meet building codes. NFPA 1402 provides for the necessary design and construction provisions of these types of buildings and gives the code enforcement community the tools necessary to properly regulate them. The scope of the standards acknowledges that building codes and gas codes do not address the unique and specific requirements for these specialized types of facilities. It is not the intent of this proposal to capture buildings that are designed, constructed, and maintained to the International Building Code and Fire Code already, such as a B or A occupancy where instruction on fire practices takes place, rather, to capture those buildings not clearly covered by the Codes that would typically require variances or modifications of code language to be compliant.

This is a multi part proposal that will propose parallel modifications to the Building Code, Fire Code, Existing Building Code, and Property Maintenance Code in order to address the design, modification, and maintenance of these types of facilities.

Cost Impact: The code change proposal will increase the cost of construction

This proposal may increase the cost of construction or the cost may remain the same, depending on how the enforcement community has previously enforced the provisions of the code on these types of buildings. Some already enforce these additional standards, others may enforce nothing, treating these buildings as outside the scope. In the second scenario, the cost may increase in order to ensure compliance with the new standards.

G100-21 Part III

G101-21

IBC: 202 (New), SECTION 429 (New), 429.1 (New), 429.2 (New), 429.3 (New), 429.4 (New), 429.5 (New), 429.5.1 (New), 429.5.2 (New), 429.5.3 (New), 429.5.4 (New), 429.5.5 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new definition as follows:

MODULAR ROOM. An occupiable prefabricated structure, consisting of walls and a ceiling, with or without an integrated floor, designed and intended for use as an office or privacy space, which may include integral electrical wiring, ventilation, and furnishings.

SLEEP POD. A modular room that is designed and used for sleeping purposes.

Add new text as follows:

SECTION 429 MODULAR ROOMS AND SLEEP PODS.

429.1 General. *Modular rooms* and *sleep pods* shall comply with Sections 429.2 through 429.5.5 and other applicable requirements in the code. *Modular rooms* and *sleep pods* shall comply with one of the following:

1. *Modular rooms* 100 square feet (9.3 m^2) or less in floor area and 8 feet (2438 mm) or less in height.
2. *Sleep pods* 36 square feet (3.3 m^2) or less in floor area, 8 feet (2438 mm) or less in height and 4 feet (1219 mm) or less in width.

Modular rooms and sleep pods exceeding these dimensions shall comply with all applicable requirements in this code.

429.2 Listing. *Modular rooms* and *sleep pods* shall be *listed* and *labeled* in accordance with UL 962 and installed in accordance with the *listing* and the manufacturer's instructions. *Modular rooms* and *sleep pods* shall be marked with the following ratings:

1. Wall and ceiling interior finish ratings as established in accordance with Chapter 8.
2. Plastic material ratings as established in accordance with Chapter 26.

429.3 Locations. *Modular rooms* and *sleep pods* shall only be installed in *approved* locations and shall not obstruct required *means of egress*.

429.4 Elevation change. *Modular rooms* and *sleep pods* with integral floors shall be permitted to have an elevation change measured from the finished floor that is a maximum of 5 inches (127 mm) higher than the floor of the existing structure outside the modular booth provided a sign is installed on each side of the door warning about the elevation change, and a distinctive marking stripe is installed across the threshold having a width of not less than 1 inch (25 mm) but not more than 2 inches (51 mm).

429.5 Sleep pods. The installation of *sleep pods* shall comply with Sections 429.5.1 through 429.5.5.

429.5.1 Locations. Where *approved, sleep pods* shall be permitted to be installed in all occupancies. Individual *sleep pods* exceeding the dimensions in Section 429.1 shall be treated as *sleeping units* and shall only be installed in locations in which *sleeping units* are allowed.

429.5.2 Multiple sleep pod installations. The installation of more than one sleep pod in a room or space shall comply with the following:

1. The area in which sleep pods are installed shall not exceed 10 percent of the building area of the story in which they are located.
2. A maximum of four sleep pods can be located adjacent to each other, and each group of sleep pods shall be separated from other groups by a minimum of 10 feet (3048 mm).
3. Stacking of sleep pods shall only be done in accordance with the manufacturer's instructions and the listing.

Exception: Installations exceeding these limitations shall be permitted based on an approved risk assessment of the installation.

429.5.3 Fire suppression. *Sleep pods* shall be installed in rooms or spaces equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

429.5.4 Smoke detection. An *automatic smoke detection system* complying with Section 907 shall be provided in the rooms or spaces in which *sleep pods* are located. The system shall activate the occupant notification system in accordance with Section 907.5.

429.5.5 Smoke alarms. Smoke alarms shall be provided in sleep pods in accordance with Section 907.2.11. Where multiple sleep pods are located in the same room or space, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate alarms in all of the sleep pods in the group that is installed in accordance with Section 429.5.2.

Reason Statement: Modular rooms and sleep pods are becoming increasingly popular, and are showing up in a variety of different occupancies.

This proposal provides a means for building officials to approve these installations and allow the use of these prefabricated structures.
This proposal treats modular rooms and sleep pods, such as those shown in the attached pictures, as products that can be installed in a building, and not as building construction, while not losing applicable code requirements. The proposal covers:

Section 429.1 places limitations on the size of modular rooms and sleep pods that are more appropriate for listed products. Modular rooms and sleep pods that exceed these size limitations will not fall under Section 429, and will be addressed with other building code requirements, including internal wirings, lighting, and other construction.

Section 429.2 - The UL 962 listing covers the fabrication and safety of the modular room. UL 962 includes requirements for insulation, finish materials, internal wiring, lighting, ventilation, and other construction features. Markings are to be provided on the listed products to document the Chapter 8 and 26 ratings, such as the ASTM E84 (UL 723) flame spread and smoke developed indexes. This makes it easy to determine their suitability for use in the specific areas of the building.

Section 429.3 allows the building official to approve the installation locations, to make sure the means of egress is not compromised and other code requirements are not adversely impacted.

Section 429.4 addresses potential tripping hazards, and is based on Section 3.1.3, Item D in ICC ES AC519, “Enclosed Booths for Installation Inside New and Existing Buildings”.

Section 429.5 includes additional requirements that are applicable to sleep pods, a type of modular room that are showing up in occupancies such as airports and office buildings. The proposal provides protection for these products by requiring the room or space in which they are installed to be provided with fire suppression and fire detection, smoke alarms in the units, and addresses multiple sleep pod installations.

These come in a variety of forms. For some examples see these links:

- https://www.sleepinginairports.net/blog/airport-sleeping-pods.htm
- https://www.aviationpros.com/airports/press-release/12339876/dubai-airports-airport-sleep-lounge-sleep-n-fly-opens-at-dxb
- https://www.flightcentre.com.au/travel-news/destinations/airport-sleeping-options
- https://www.pinterest.com/pin/340584790540317201/
- https://dickinsonstatenews.com/dickinson-state-is-making-life-a-little-easier-for-parents-of-young-children/

Cost Impact: The code change proposal will increase the cost of construction
The cost of these construction will increase since these products are not currently regulated.

G101-21

G102-21

IBC: 202 (New), SECTION 429 (New), 429.1 (New), 429.2 (New), 429.3 (New), ICC Chapter 35 (New)

Proponents: Tom Hardiman, representing Modular Building Institute (tom@modular.org)

2021 International Building Code

Add new definition as follows:

OFF-SITE CONSTRUCTION. . A modular building, modular component, panelized system or tiny house which is designed and constructed in compliance with Section 429 of this code and is wholly or in substantial part fabricated or assembled in manufacturing plants for installation - or assembly and installation - on a separate building site and has been manufactured in such a manner that all parts or processes cannot be inspected at the installation site without disassembly, damage to, or destruction thereof.

Add new text as follows:

SECTION 429 OFF-SITE CONSTRUCTION.

429.1 General. This section applies to off-site construction and shall govern the requirements for planning, design, fabrication, assembly, inspection and regulatory compliance.

429.2 Construction. In addition to other applicable requirements in this code, off-site construction shall be constructed in accordance with ICC 1200.

429.3 Regulatory Compliance. In addition to other applicable requirements in this code, off-site construction shall be inspected and regulated in accordance with ICC 1205.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
500 New Jersey Ave NW 6th Floor
Washington DC 20001

ICC 1200-2021: Standard for Off-Site Construction: Planning, Design, Fabrication and Assembly

ICC 1205-2021: Standard for Off-Site Construction: Inspection and Regulatory Compliance

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC 1200-2021 and ICC 1205-2021, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Interest in off-site construction including modular and panelized systems and tiny houses is growing. Off-site construction has been identified as a solution for multiple societal and industry challenges including affordability, sustainability, job site safety, and the availability of skilled workers. However, many segments of the building industry including code officials, building owners, designers and contractors are often unfamiliar with these processes. While all off-site construction projects (with the exception of manufactured housing covered under the U.S. Department of Housing and Urban Development's Manufactured Home Construction and Safety Standards) must meet the requirements of the code in place at the final project site, the translation between code requirements and the off-site construction process is not always clear. To facilitate enhanced understanding of the off-site construction process, assure off-site projects maintain the requirements in code and are implemented in an efficient manner for both AHJs and manufacturers, the International Code Council (ICC) and the Modular Building Institute (MBI) initiated a joint project to write standards for the planning, design, fabrication, assembly, inspection and regulatory compliance of off-site and modular construction in February 2019.
A standard development committee was created by the ICC Board of Directors in July 2019, and the first meeting of that committee was in October of 2019. The scope of standard ICC 1200 is to provide minimum requirements to safeguard the public health, safety, general welfare and address societal and industry challenges in multiple facets of the off-site construction process including: planning, designing, fabricating, transporting and assembling commercial and residential building elements. The scope of standard ICC 1205 is to provide minimum requirements for the inspection and regulatory compliance of off-site construction.

Off-site (or modular) construction entails the planning, design, fabrication and assembly of building elements at a location other than the location where they were fabricated. Large components of a structure can be assembled in a factory-like setting and transported to the building site for final assembly. Subsequently, the finished construction is required to comply with the model building code adopted by the local authority having jurisdiction. These standards provide planning and preparation requirements such as: the role of the architect/modular manufacturer/construction manager/general contractor, location of plant vs construction site, engagement early on in the process, material procurement and lead times, and change orders. These standards also provide for requirements for a controlled manufacturing environment, supply chain integration, structural modular vs non-structural modular (e.g. bathroom pods), the fabrication process and on-site assembly such as: staging area for construction materials, foundation, placing modules, structural connections, utilities (PMG), weather considerations, finishing mate lines, inspection, approval and regulatory compliance of off-site residential and commercial construction components and their assembly and completion at the final building site such as: permitting; in-plant and on-site final inspections; third party inspections; the role of Industrialized Building Departments, state modular programs and the Authority Having Jurisdiction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal outlines off-site construction methods that may be unfamiliar to inexperienced industry participants and offers a model regulatory process to address state and local needs.

G102-21

G103-21

IBC: 503.1, 602.1

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

2021 International Building Code

Revise as follows:

503.1 General. Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area ~~limitations,~~ and height limitations~~ and type of construction~~, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five *construction types* defined in Sections 602.2 through 602.5. The *building elements* shall have a *fire-resistance rating* not less than that specified in Table 601 and *exterior walls* shall have a *fire-resistance rating* not less than that specified in Table 705.5. Where required to have a *fire-resistance rating* by Table 601, *building elements* shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in *building elements* shall not be required unless required by other provisions of this code.

Exception: Each portion of a building separated by one or more fire walls complying with Section 706 shall be considered separate buildings and shall be permitted to be of different construction types.

Reason Statement: The reference to type of construction is out of context in Chapter 5, which is specifically addressing building height and area. The provision allowing buildings to be constructed of varying types should be included in Chapter 6 where all of the types are defined and the charging language implies that a building may only be of a single construction type.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This amendment does not change any Code requirement. It is only moving it to a more logical location in the Code.

G103-21

G104-21

IBC: 503.1, Figure 503.1 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (joecainpe@gmail.com); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov)

2021 International Building Code

Revise as follows:

503.1 General. Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area limitations, height limitations and type of construction, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

Exceptions:

1. Rooftop-mounted photovoltaic (PV) panel systems shall not constitute an additional story or additional floor area and shall be permitted to exceed the height limit of a building where one of the following conditions are met:

   1.1. For all occupancies, the highest point of the PV panel system shall meet the lower of the following values:

   1.1.1. 3 feet (915 mm) above the allowable building height.

   1.1.2. 3 feet (915 mm) above the roof of the building immediately below.

   1.2. For installations on low-slope roofs (roof slope < 2:12) in other than Group R-3 and R-4 occupancies, the highest point of the PV panel system shall meet the lower of the following values:

   1.2.1. 10 feet (3050 mm) above the allowable building height.

   1.2.2. 10 feet (3050 mm) above the roof of the building immediately below.

2. Photovoltaic (PV) support structures installed on the roof of an open parking structure shall not constitute an additional story or additional floor area and shall be permitted to exceed the height limit of a building where all the following conditions are met (see Figure 503.1):

   2.1. The area within the perimeter of PV support structures has maximum rectangular dimension of 40 feet by 150 feet (12 195 mm by 45 720 mm).

   2.2. The distance between PV support structures is a minimum of 10 feet (3050 mm) clear.

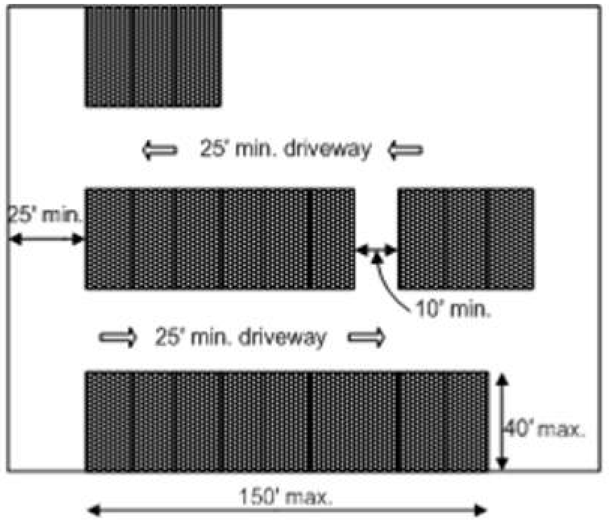
   2.3. The driveway aisle separating PV support structures has a minimum width of 25 feet (7620 mm) clear.

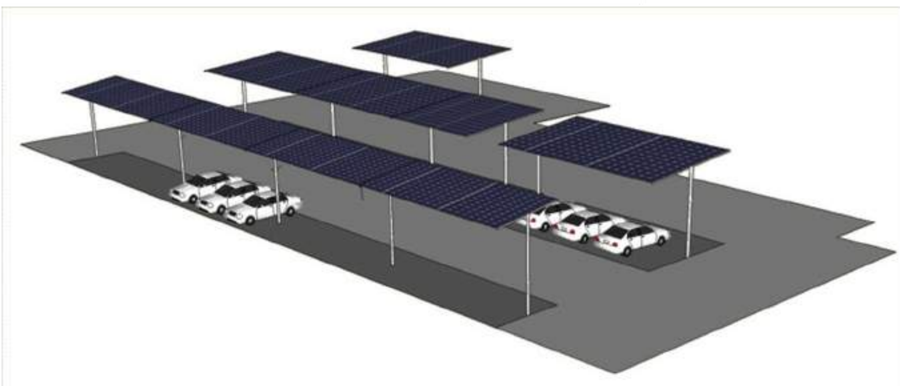
   2.4. PV support structures are used only for parking purposes with no storage.

   2.5. PV support structures are completely open on all sides, other than necessary structural supports, with no interior partitions.

Add new text as follows:

Figure 503.1 Location of PV Support Structures on Open Parking Structures.





Staff Note: This proposal addresses similar requirements in a different manner to those found in current code section IBC Section 1511.2.1 and 311.3.4 and IFC Section 1205. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary objective of this proposal is to provide exceptions to clarify that elevated PV support structures can be installed on top of a multi-story parking garage under certain conditions without impacting restrictions on number of stories, height or area. Likewise, under certain conditions, rooftop-mounted PV systems do not cause a building to be noncompliant with these provisions.
The exceptions in this proposal are similar to exceptions that have existed in the California Building Code for several cycles, with support of the fire service and without any compromises in safety to the building or fire fighters. These exceptions will not impact the ability to fight fires on top of buildings.

Without the exceptions proposed here, rooftop solar structures can be interpreted to constitute an additional story of the building, increase the overall building height or where there is a use underneath such as elevated PV support structures, increase the floor area of the building. As a result, solar installations may not be allowed in buildings that are built to the maximum height, story or floor area. The proposed code revision provides an exemption for photovoltaic systems from these code restrictions.

Exception 1: This amendment allows solar PV systems to be installed above the maximum building height specified by code with limitation. This amendment will make it feasible to install rooftop solar PV systems on top of buildings that are built to the maximum height which is especially common in existing buildings. It will also make it practical for PV panels to be installed above the roof with the required tilt angle and be at a height that avoids interference with vents and equipment on the roof. **Exception 2:** The amendment allows solar PV panel installations over parking stalls to be installed without being considered a story or floor area, these restrictions may prevent solar PV systems from being installed in buildings that have the maximum number of stories or floor area which is especially common in existing buildings. The exception requires minimum spacing between solar PV panel structures to allow fire access and provide a fire break.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

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

It encourages the use of solar without adversely impacting safety.

G104-21

G105-21

IBC: 503.1.4.1

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

2021 International Building Code

Revise as follows:

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

~~**Exception:**~~ <u>**Exceptions:**</u>

1. Penthouses constructed in accordance with Section 1511.2 and towers, domes, spires and cupolas constructed in accordance with Section 1511.5.
2 <u>Required guards shall be permitted to be greater than 48 inches (1219 mm) above the surface of the occupied roof where the roof deck is located more than 75 feet (22 860 mm) above the level of fire department vehicle access.</u>

Reason Statement: The limit on the guard height was based on fire department access to the roof. Once the roof deck is higher than fire ladder access, this is no longer justification for this limitation. There has been concerns that higher guards are needed on higher roofs to prevent people from jumping off the roof deck and/or to allow for wind breaks to limit items blowing off the roof deck and falling on people below.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This allows additional design options for guards around roof decks.

G105-21

G106-21 Part I

PART I - IBC: 503.1.4.2 (New)
PART II - IBC: 1015.2 (IFC[BE] 1015.2)

Proponents: Lee Kranz, City of Bellevue, WA, representing Myself (lkranz@bellevuewa.gov)

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

2021 International Building Code

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

Exceptions:

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

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

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

Add new text as follows:

503.1.4.2 Guards. Occupied roofs shall have guards in accordance with Section 1015.2.

G106-21 Part I

G106-21 Part II

PART II - IBC: 1015.2 (IFC[BE] 1015.2)

Proponents: Lee Kranz, City of Bellevue, WA, representing Myself (lkranz@bellevuewa.gov)

2021 International Building Code

Revise as follows:

1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be provided at the perimeter of the occupied portions of an occupied roof. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.

Reason Statement: This code change is needed to protect children. There are many cases where the design of an occupied roof includes only a portion of the entire roof area. The occupied portions of the roof are typically elevated 18" or less above the adjacent unoccupied areas of the roof, therefor no guard is currently required per Section 1015.2. This issue is regularly debated on building official chat lines and other forums due to the lack of regulatory authority to require the guard in this design scenario. Even the idea of a small child falling to their death because they bolted from a parent or guardian to look over the edge of a roof is unthinkable. Occupied roofs are relatively new in the IBC and we're discovering issues related to their design on a regular basis. This code change will eliminate or drastically reduce the potential for kids, or even adults who may be inebriated, from falling over the edge of a roof which even if the occupied portion of the roof is some distance away from the roof edge.
Adding a new Section 503.1.4.2 Guards, will insure that the reader will go to Section 1015.2 to see that guards are required. Examples of this can be found in Sections 406.4.1, 505.3.3 and 1029.17.

Cost Impact: The code change proposal will increase the cost of construction
The cost to construct some occupied roofs where the edge of the occupied portion of the occupied roof is inboard of the roof edge will go up due to the installation of guards.

G106-21 Part II

G107-21

IBC: TABLE 504.3, TABLE 504.4

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Scott Campbell, representing National Ready Mixed Concrete Association (scampbell@nrmca.org); Amy Trygestad, CRSI, representing CRSI (atrygestad@crsi.org); Edith Smith, representing PCI (esmith@pci.org)

2021 International Building Code

Revise as follows:

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE[a]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	**TYPE OF CONSTRUCTION**												
	See Footnotes	**Type I**		**Type II**		**Type III**		**Type IV**				**Type V**	
		A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**C**	**HT**	**A**	**B**
B	NS[b]	UL	160	~~65~~ 80	55	65	55	65	65	65	65	50	40
	S	UL	180	~~85~~ 100	75	85	75	270	180	85	85	70	60
R[h]	NS[d]	UL	160	~~65~~ 80	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	180	~~85~~ 100	75	85	75	270	180	85	85	70	60

For SI: 1 foot = 304.8 mm.

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
B	NS	UL	11	~~5~~ 6	3	5	3	5	5	5	5	3	2
	S	UL	12	~~6~~ 7	4	6	4	18	12	9	6	4	3
R-1[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3
	S	UL	12	~~5~~ 6	5	5	5	18	12	8	5	4	3
R-3[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	3
	S13D	4	4									3	3
	S13R	4	4									4	4
	S	UL	12	~~5~~ 6	5	5	5	18	12	5	5	4	4
R-4[h]	NS[d]	UL	11	4	4	4	4	4	4	4	4	3	2
	S13D	4	4									3	2
	S13R	4	4									4	3
	S	UL	12	~~5~~ 6	5	5	5	18	12	5	5	4	3

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: Since development of the early building codes, and even with the International Building Code today, building size has typically been determined based on a combination of factors; (a) the occupancy type for the building; (b) the materials used to construct the building; and (c), the presence of automatic sprinkler protection. Regarding occupancy types, the fire loads associated with contents found in a particular occupancy group and the relative risk of danger to the occupants from fire because of the occupancy characteristics are considered. For the materials used to construct the building the presence of combustible materials used in the construction of the building structure itself are key. As the quantity of combustible materials decreases the relative risk of fire size, spread of fire to adjacent properties, and danger to the fire service are less such that the building sizes are allowed to increase. Another factor considered from a building materials aspect is the degree of fire resistance provided. When structural fire resistance is provided to the load carrying structural members the risk of damage to the structure or potential for collapse is also considerably reduced. Finally, sprinkler protection has consistently been utilized as a factor in allowing increases in the size of buildings. A good discussion of these concepts can be found in the report "*Fire-Resistance Classifications of Building Construction*", Report BMS92, National Bureau of Standards, October 7, 1942.

One thing of importance in the report is that buildings constructed of noncombustible materials and provided with at least 1-hour of fire resistance (classified as Fireproof construction in the report) were considered to be a much lower risk to the safety of the occupants and fire service, and to the spread of fire, than buildings constructed of noncombustible materials with little or no fire resistance (classified as Incombustible construction in the report). The same was said for buildings constructed with a combination of noncombustible exterior walls and interior combustible structural materials (classified as Exterior-Protected construction in the report). Hence the report advised that these noncombustible buildings with at least 1-

hour fire resistance could be built to taller heights due to the lack of combustible materials in the structural systems and the presence of structural fire resistance.

The merits of the BMS 92 conclusions are reflected in the following analysis that shows that a building constructed of noncombustible materials poses a far less risk to the occupants and fire service than one constructed wholly or partly of combustible materials. This analysis was done by comparing the fire load density (FLD) of an occupied floor for an example Group R, Residential occupancy building constructed of Type IIA construction and the same building constructed of Type IIIA construction.

The FLD can be defined as the fire load per unit floor area of a building and is well documented to reflect the total fire load in a building consisting of: (1) *combustible materials generally comprising furniture, equipment and stored objects & goods*; and (2), *combustible components of the structural elements (permanent fire load) which can burn during a fire*. [p 1131, Chapter 35, SFPE Handbook of Fire Protection Engineering, Vol. 1, 2016.]. In comparing buildings of Type IIA construction with Type IIIA construction, the fire load portion of the FLD attributable to furniture, equipment, etc. can be treated as equal since it can be assumed the residents of a dwelling unit will have the same general fire load regardless of the building construction type. Thus, the main difference in the FLD of the building which can pose additional risk to occupants and fire service will be reflected by the permanent fire load of the structural components which can burn during a fire (e.g. the structural wood components).

The example building used in the analysis below is a fully sprinklered, 5-story apartment building that is 23,056 square feet in footprint area. The typical floor plan and dimensions are shown in Figure 1.

Building structural features are approximately as follows:

- Exterior walls (bearing) - 2X6 fire retardant treated wood studs @ 16-in o.c. – Total length of wall per floor = 766 feet
- Interior walls (bearing) between dwelling units – DBL 2X4 wood studs @ 16-in o.c. – Total length of wall per floor = 480 feet
- Interior corridor walls (bearing) - 2X4 wood studs @ 16-in o.c. – Total length of wall per floor = 580 feet
- Floor system – 18-inch wood floor trusses, 3/4-inch gypcrete on 3/4-structural wood floor panel, 5/8-in Type X GWB ceiling on resilient channels.
- Roof system – pre-engineered wood trusses (4:12 slope), 5/8-in structural wood sheathing, asphalt shingle roof.

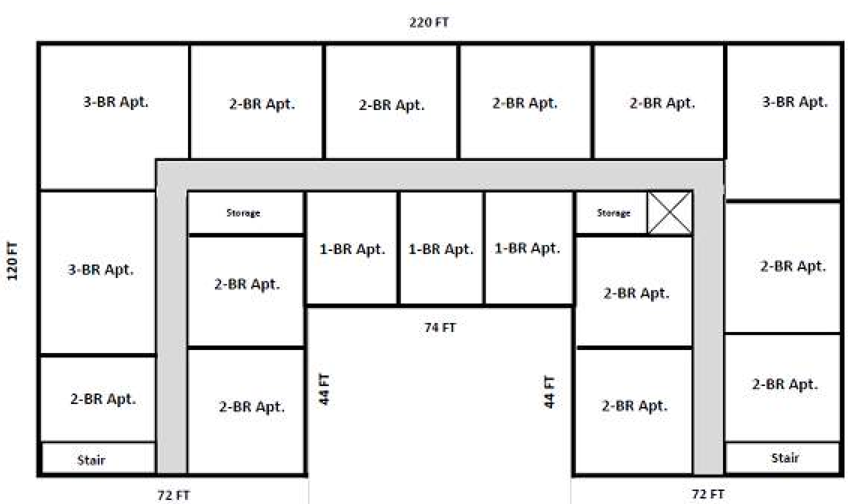


FIGURE 1

Typical Floor for 5-story Apartment Building

The permanent fire load of the structural components of a Type IIA building can generally be considered insignificant since the components are required to be of non-combustible materials according to the IBC. For the Type IIIA building the analysis examined the structural fire load contributed by the framing members of the exterior walls, the interior dwelling unit separation walls, the interior corridor walls and the structural wood floor panels. The additional contribution to the fire load density (FLD) by the combustible interior non-bearing walls within each apartment and the floor trusses were not included for simplicity of the calculations but, their inclusion would significantly increase the FLD for each floor of the building so the conclusions reported in this analysis are conservative.

In Section 7.3.2 of NFPA 557, *Standard for Determination of Fire Loads for Use in Structural Fire Protection Design, 2016,* the heat of combustion value for materials derived entirely of wood can be accepted as the value of 15MJ/kg. Further, in recognition of the fire retarding properties of some wood products, Section 7.3.4.6 of NFPA 557 permits the heat of combustion value to be taken as 10 MJ/kg. These values, converted to IP units, were used in this analysis. The IP units used are 6448 BTU/LB for untreated wood and 4,299 BTU/LB for fire retardant treated wood, respectively.

The wood species used in buildings of Type IIIA construction can vary depending on location and structural design parameters however, conservatively, the wood density was assumed to be 33-LB/FT^3. This value is consistent with the mid-range density for several wood species commonly used for light wood frame buildings. Taking into consideration a combination of wood studs, and top and bottom plates, the fire load contribution of wood for the three wall systems based on the heat of combustion of the wood can be summarized as follows [Ceiling height of the example apartment was specified at 8-ft 11-in]:

- 766 feet of 2X6 fire retardant wood studs for the exterior walls contributes approximately 61 million BTUs to the fire load per floor.

- 480 feet of DBL 2X4 wood studs for the tenant walls contributes approximately 68 million BTUs to the fire load per floor.

- 580 feet of 2X4 wood studs for the corridor walls contributes approximately 42 million BTUs to the fire load per floor.

In addition to the walls noted, consideration was also given to include the quantity of wood floor sheathing contributing to the fire load for the typical floor. Based on nominal 3/4-thick structural wood panels and excluding the floor openings for the two stairs and elevator shaft, the contribution is estimated to be 281 million BTUs per story for the 23,056 ft^2 example building floor area.

Thus, the fire load attributable to much of the wood framing on each story of the example building is approximately 450 million BTUs of fire load. Divided by the building area this results in an FLD attributable to the main light framed wood walls and floor deck of about 19,500 BTU/ft^2. This value makes it apparent why the BMS 92 Study referenced above concluded that noncombustible buildings with one-hour fire resistance (i.e. Type IIA) “were considered a much lower risk to the safety of the occupants and the fire service, and to the spread of fire” than buildings classified as Exterior-Protected construction (i.e. Type III) in the report. To further illustrate this point, Figures 2 and 3 show two buildings under construction. Figure 2 is a 6-story building of noncombustible framing (i.e. like Type II). Figure 3 is a 5-story building of combustible framing (i.e. like Type III). These pictures illustrate graphically the difference in the amount of combustible materials present based on construction type reflected by the analysis above.

Figure 2

Noncombustible Framing

Figure 3

Combustible Framing

Recognizing the lower fire risk of Type IIA construction compared to Type IIIA and Type IV construction, this code change will permit Group B and Groups R occupancy buildings of Type IIA construction to be built one story and 15-feet higher. These increases are attributed to elimination of the fire load present in the structural components, combined with the 1-hour fire resistance for these noncombustible structural elements, consistent with the fire safety premises for building construction types in BMS92. The new story heights are increased in proportion to the story heights/number of stories for existing buildings of Type IIA Group B and Groups R, with rounding to be consistent with other values in Table 504.3. This proposal is also consistent with story increase allowed for Group F and S occupancy buildings, which contain much larger FLD due to contents, when changing from Type IIIA construction to Type IIA construction in Table 504.4.

This increase is also similar to the special height increase permitted for Group R-1 and R-2 buildings of Type IIA construction in Section 510.6. Section 510 of the IBC contains special provisions whereby buildings designed and constructed in accordance with that section are permitted to be larger in height and/or area than buildings built to the typical IBC height and area tables. Section 510.6 specifically allows a height increase for Type IIA buildings of Groups R-1 and R-2 up to nine stories and 100-feet in height provided:

- The building separation distance from other buildings is at least 50-feet.
- The building exits are segregated in an area enclosed by 2-hour fire walls.
- The first-floor assembly of the building has a fire resistance of 1-1/2 hours.

Instead of increased separation distance, exit segregation by fire walls and increased 1st-Floor fire resistance, the added fire safety feature in this proposal for allowing the 1-story increase for Group B & R occupancy buildings is the removal of combustible materials from the structure that would contribute to the overall fire load. This proposed code change will allow Group R-1 & R-2 buildings of Type IIA construction up to 6-stories in recognition that the fire risk to occupants and the fire service is significantly reduced when combustible structural components permitted in 5-story Type IIIA construction buildings are removed to meet Type IIA construction.

Recognizing the lower fire risk of Type IIA construction compared to Type IIIA and Type IV construction, this code change proposes permitting Group B and Groups R1 & R2 buildings of Type IIA construction to be built one story and 15-feet higher. These increases are attributed to elimination of the fire load present in the structural components, combined with the 1-hour fire resistance for these noncombustible structural elements, consistent with the fire safety premises for building construction types in BMS92. The new story heights are increased in proportion to the story heights/number of stories for existing buildings of Type IIA Group B and Groups R1 & R2, with rounding to be consistent with other values in Table 504.3.

Cost Impact: The code change proposal will decrease the cost of construction
Presently Group B and R occupancy buildings of noncombustible construction with 1-hour fire resistance (i.e. Type IIA) are only allowed to be built to the same story height as buildings of Group B and R occupancy with a combination combustible/noncombustible construction and a 1-hour fire resistance (i.e. Type IIIA and IV-HT). However, to build Group B or R occupancy buildings of noncombustible construction taller, the fire resistance of the structural elements (i.e. columns and floors) are required to be increased from 1-hour to 2-hours (i.e. Type IB construction).

This proposal recognizes the improved fire safety of Group B and R occupancy buildings of Type IIA construction, compared to Types IIIA and IV-HT construction of the same occupancy groups, since Type IIA buildings have a reduced fire density load associated with the reduced use of combustible structural components. Allowing one additional story height of Group B and R occupancy buildings without having to increase the fire resistance of columns and floors will reduce the cost of construction of these noncombustible buildings Group B and R occupancies.

G107-21

G108-21

IBC: 504.4

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Revise as follows:

504.4 Number of stories. The maximum number of *stories above grade plane* of a building shall not exceed the limits specified in Table 504.4.

> **Exception:** In Group A, B, M, R, S and U occupancies, where a building of Type II, III-A, or V-A construction is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and complies with the high-rise provisions in accordance with Section 403, the values specified in Table 504.4 for maximum allowable number of stories above grade plane is increased by one.

Reason Statement: The maximum allowable number of stories that occur within a building does not directly impact the level of fire protection and life safety features provided within it. Rather, these features are determined entirely by the a) elevation of the highest occupied floor level and b) overall building height (in feet) of the structure.
IBC Table 504.4 limits the maximum number of allowable stories that may occur within a given building based upon its occupancy group and type of construction. This is permitted to be increased by one additional story where it is provided with an automatic sprinkler system. This sets the precedent that an increase in the level of fire protective features allows a greater number of stories within a given structure.

The application of the added exception proposed in this amendment is voluntary. Precedence set by base code recognizes that the inclusion of high-rise features provide yet another (higher) level of protective features that would justify the allowance of one (1) additional floor level to be added within these structures. The application of the high-rise building design provisions (per IBC Section 403) significantly increases both the active and passive fire protection features within a building. Among other design elements, these include the addition of pressurized stair enclosures, a secondary water supply, a fire command center room, and a smoke removal (mop-up) system.

It is important to note that this amendment does not increase the maximum allowable building height. It also has no impact on the maximum elevation of the highest allowable occupied floor level within it. This is because the highest occupied floor level may occur at any elevation within the maximum building height, regardless of the number of stories within it. Per the base code, a fully-sprinklered Type V-A apartment building (Group R-2) with 4-stories is permitted to have an overall building height of 70-feet (per IBC Table 504.3). This means that the 4th floor finish elevation could reasonably occur at 54-ft. However, with this amendment, the same building could consist of 5-stories, with the 5th floor finish elevation also at 54-ft. This means that the risk factors for both occupants and fire responders are not increased by allowing the additional story.

Further, this example of a building with the highest occupied floor level at 54-ft means that it does not qualify as a high-rise building, thus it is not required to be provided with those additional design provisions per IBC Section 403. Further, this example of a building with the highest occupied floor level at 54-ft means that it does not qualify as a high-rise building, thus it is not required to be provided with those additional design provisions per IBC Section 403.

Based on the requirements noted within this proposal, it could be asserted that a 5-story Type V-A apartment building (Group R-2) with all high-rise provisions designed into it would be more safe (from a fire protection & life safety standpoint) than a 4-story Type V-A apartment building not having any of the high-rise provisions at all.

Finally, the occupancy groups are limited to exclude Groups E, F, H, and I because those buildings typically have a unique and divergent set of building code requirements that represent a higher level of risk factors with respect to fire & life safety features. Thus, these groups are excluded from this proposed amendment.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is a voluntary exemption and is not required.

G108-21

G109-21

IBC: TABLE 504.4

Proponents: Jeffrey Grove, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

TABLE 504.4
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	See Footnotes	TYPE OF CONSTRUCTION											
		Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	12	6	~~4~~ 5	6	4	18	12	9	6	4	3

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing *building height* in accordance with the *International Existing Building Code*.

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Fire Code.

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Reason Statement: In general, the allowable height measured in stories for business occupancies is equal to or higher than the allowable height for group R residential occupancies. This is in recognition that occupants in business occupancies are generally awake and alert, while occupants of group R residential buildings may be sleeping, and thus take longer to evacuate.
However, for buildings of type IIB constriction that are sprinklered in accordance with NFPA 13, table 504.4 allows R residential buildings to be five stories in height, but it only allows group B buildings to be four stories in height. Table 504.3 allows both group B and group R buildings of type IIB construction that are sprinklered in accordance with NFPA 13 to be 75 feet in height.

Cost Impact: The code change proposal will decrease the cost of construction
Construction cost would decrease as an additional story could be constructed of Type IIB construction for a Group B occupancy building.

G109-21

G110-21

IBC: 504.5 (New)

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

2021 International Building Code

504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.

> **Exception:** Towers, spires, steeples and other *rooftop structures* shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1511.2.4. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height where of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable *building height* where of combustible materials (see Chapter 15 for additional requirements).

504.4 Number of stories. The maximum number of *stories above grade plane* of a building shall not exceed the limits specified in Table 504.4.

Add new text as follows:

504.5 Buildings on sloped sites. Where a building is stepped or terraced, the height and number of stories of the building is the maximum height or number of stories of any segment of the building using the entire perimeter of each segment to establish grade plane.

Reason Statement: There currently is no guidance in the code for how to measure the height and number of stories when a building is located on a sloped site. This code change will provide the needed guidance and result in more consistency to determine the height and number of stories for buildings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is for clarification only and will not impact the cost of contstruction.

G110-21

G111-21

IBC: 505.3.4 (New)

Proponents: Jason Phelps, City of Hillsboro, representing City of Hillsboro (jason.phelps@hillsboro-oregon.gov)

2021 International Building Code

Add new text as follows:

<u>**505.3.4 Hazardous materials.** Equipment platforms shall not include the storage or use of hazardous materials in excess of the maximum allowable quantities for a single control area.</u>

Reason Statement: This proposal is meant to add clarity to what an equipment platform is meant to be used for. Storage or use of hazardous materials on an equipment platform presents many unsafe conditions that should not be allowed.
First, an equipment platform is allowed to have a means of egress that is not fully compliant as would be required for an occupied space. This is dangerous for occupants of the space that are continually present maintaining process equipment and hazardous material storage equipment.

Second, hazardous material storage in excess of the MAQ's is always supposed to be considered an occupied space, evident by all the H Occupancy Groups in Chapter 3.

H-5 occupancies can currently use an equipment platform to essentially gain a 5th story above grade, used for hazardous material storage, which is not allowed per Table 504.4 for any construction type.

Equipment platforms are being built in excess of 100,000 s/f as what should be considered a 5th story above grade, greater than 80 feet above the level of fire department vehicle access, and there is currently nothing specifically in the code to limit the storage of hazardous materials in this scenario.

The above scenario should be requiring high-rise provisions to kick in, but with the current equipment platform loophole, it is considered an un-occupied space.

To summarize, hazardous material storage should never be considered an un-occupied space. The code allows the elimination of to many safety features for un-occupied spaces and it is dangerous to the occupants of those spaces.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase the cost of construction, as it is something that technically should not be allowed currently.

G111-21

G112-21 Part I

PART I - IBC: SECTION 202 (New), SECTION 506 (New)
PART II - IBC:1011.14, 1015.2, 1015.3 (IFC[BE]1011.14, 1015.2, 1015.3)
PART III - IFC: 907.2.11.1, 907.2.11.2 (IBC:[F] 907.2.11.1, [F] 907.2.11.2)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE GENERAL CODE COMMITTEE. PART II WILL BE HEARD BY THE MEANS OF EGRESS CODE COMMITTEE. PART III WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Building Code

Add new definition as follows:

EGRESS ROOF ACCESS WINDOW. A skylight or roof window designed and installed to satisfy the emergency escape and rescue opening requirements of Section 1031.

SLEEPING LOFT. A sleeping space on a floor level located more than 30 inches (762 mm) above the main floor and open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches (2032 mm).

LANDING PLATFORM. A landing provided as the top step of a stairway accessing a sleeping loft.

Add new text as follows:

SECTION 506 SLEEPING LOFT.

506.1 General. *Sleeping lofts* shall comply with Sections 506.1 through 506.5.

506.2 Sleeping loft area and dimensions. Sleeping lofts shall meet the minimum area and dimension requirements of Sections 506.2.1 through 506.2.3. A s*leeping loft* or *sleeping lofts* in compliance with Section 506.2 shall be considered a portion of the story below. Such *sleeping lofts* shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the *sleeping loft* shall be included in determining the *fire area*.

506.2.1 Area. *Sleeping lofts* shall have a floor area of not less than 35 square feet (3.25 m^2) and less than 70 square feet (6.5 m^2).

506.2.2 Minimum horizontal dimensions. *Sleeping lofts* shall be not less than 5 feet (1524 mm) in any horizontal dimension.

506.2.3 Height effect on sleeping loft area. Portions of a *sleeping loft* with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft but shall contribute to the maximum allowable area.

> **Exception:** Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50-percent slope), portions of a sleeping loft with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the sleeping loft but shall contribute to the maximum allowable area.

506.3 Sleeping loft access and egress. The access to and primary egress from sleeping lofts shall be of any type described in Sections 506.3.1 through 506.3.5 and shall meet the sleeping loft where the sleeping loft's ceiling height is not less than 3 feet (914 mm) along the entire width of the access and egress component.

506.3.1 Stairways. Stairways accessing sleeping lofts shall comply with Sections 506.3.1.1 through 506.3.1.7.

506.3.1.1 Headroom. The headroom above the sleeping loft access and egress shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread, landing, or landing platform nosing's in the center of their width, and vertically from the landing or landing platform along the center of its width.

506.3.1.2 Width. Stairways accessing a sleeping loft shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The width below the handrail shall be not less than 20 inches (508 mm).

506.3.1.3 Treads and risers. Risers for stairs accessing a sleeping loft shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:

1. The tread depth shall be 20 inches (508 mm) minus four-thirds of the riser height.
2. The riser height shall be 15 inches (381 mm) minus three-fourths of the tread depth.

506.3.1.4 Landings. Intermediate landings and landings at the bottom of stairways shall comply with Section 1011.6, except that the depth in the direction of travel shall be not less than 24 inches (508 mm).

506.3.1.5 Landing platforms. The top tread and riser of *stairways* accessing *sleeping lofts* shall be constructed as a *landing platform* where the loft ceiling height is less than 6 feet 2 inches (1880 mm) where the stairway meets the *sleeping loft*. The *landing platform* shall be not less than 18 inches (508 mm) in width and in depth measured horizontally from and perpendicular to the nosing of the *landing platform*. The *landing platform* riser height to the edge of the *sleeping loft* floor, shall not be greater than 18 inches (508 mm) in height.

506.3.1.6 Handrails. *Handrails* shall comply with Section 1011.11.

506.3.1.7 Stairway guards. *Guards* at open sides of *stairways*, *landings*, and *landing platforms* shall comply with Section 1115.

506.3.2 Ladders. Ladders accessing sleeping lofts shall comply with Sections 506.3.2.1 and 506.3.2.2.

506.3.2.1 Size and capacity. Ladders accessing sleeping lofts shall have a rung width of not less than 12 inches (305 mm), and 10-inch (254 mm) to 14-inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a 300-pound (136 kg) load on any rung. Rung spacing shall be uniform within 3/8 inch (9.5 mm).

506.3.2.2 Incline. Ladders shall be installed at 70 to 80 degrees from horizontal.

506.3.3 Alternating tread devices. *Alternating tread devices* accessing *sleeping lofts* shall comply with Section 1011.14. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

506.3.4 Ships ladders. Ships ladders accessing sleeping lofts shall comply with Sections 1011.15. The clear width at and below handrails shall be not less than 20 inches (508 mm).

506.4 Sleeping Loft Guards. Guards shall be located along open sides of sleeping lofts that are located more than 30 inches (762 mm) measured vertically to the floor below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Sleeping loft guards shall be constructed in accordance with Section 1015.

506.5 Emergency escape and rescue openings. *An emergency escape and rescue opening* shall be located in each *sleeping loft.*

Exception: Sleeping lofts where an egress roof access window is provided complying with Section 1031.3.

G112-21 Part I

G112-21 Part II

PART II - IBC:1011.14, 1015.2, 1015.3 (IFC[BE]1011.14, 1015.2, 1015.3)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

2021 International Building Code

Revise as follows:

1011.14 Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in any of the following locations:

1. ~~buildings of~~ Groups F, H and S from a mezzanine not more than 250 square feet (23 m^2) in area and that serves not more than five occupants~~;~~ .
2. ~~in buildings of~~ Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area ~~and~~ .
3. For ~~for~~ access to unoccupied roofs
4. Group R from sleeping lofts.

Alternating tread devices used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be located along sleeping lofts in accordance with Section 506.4. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.

1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the leading edges of the tread *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual *dwelling units* in occupancies in Group R-2 not more than three stories above grade in height with separate *means of egress*, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. *Sleeping loft guards* shall be not less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less.

4.5. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.

5.6. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

6.7. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

G112-21 Part II

G112-21 Part III

PART III - IFC: 907.2.11.1, [F] 907.2.11.2 (IBC:[F] 907.2.11.1, [F] 907.2.11.2)

Proponents: Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov); Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jonsiuconsulting@gmail.com)

2021 International Fire Code

Revise as follows:

907.2.11.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas <u>and in each sleeping loft</u>.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.11.2 Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room<u> sleeping loft and</u> used for sleeping purposes.
3. In each story within a *dwelling unit*, including *basements* but not including crawl spaces and uninhabitable attics. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

Reason Statement: This proposal takes an important part of the Residential Code Appendix Q outlining the design criteria for a loft, modifies some of the requirements, and then incorporates it into the main sections of the IBC with definitions and a new section. This proposal provides allowances and limitations on designed spaces specifically identified as a sleeping loft, while clearly differentiating these small spaces from mezzanines and other habitable space.
The proposal requires these small spaces to include smoke detection and an emergency escape and rescue opening. A sleeping loft in an IBC dwelling unit would provide the equivalent safety standards as a loft located in a small dwelling unit as currently allowed in IRC Appendix Q. Expanding the availability of sleeping lofts will promote more broad uses of space, while possibly allowing for an increase in housing density and affordability.

Most of the technical provisions are taken from IRC Appendix Q. However, the list below explains the differences between this proposal and Appendix Q, and our rationale.

- "sleeping loft" vs "loft" – we want to trigger smoke alarm, emergency escape/rescue opening.
- 506.2.1: Imposes max. 70 sf area. Intent is to keep these small, without being able to circumvent minimum habitable space requirements for larger rooms. Thus, beyond 70 sf, space should meet full interior dimension requirements for habitable space (IBC 1208) and mezzanines (IBC 505)
- 506.3: Requires 3' ceiling height at access/egress component. Stair requires 6'2" headroom, but ladders, alternating tread devices, and ships ladders have no similar requirement. Ceiling heights of less than 3' are allowed, and nothing states that the ladders, etc. can't be placed in those lower-ceiling areas. Some minimum height above the device is necessary to allow people in the sleeping loft to egress in an emergency.
- 506.3.1.5: Allows 18" landing platforms, vs "18 to 22 inches" in direction of travel in Appendix Q. Picked lower limit, since Appendix Q doesn't say when to use anything larger. Allows 18" rise from landing platform to loft floor, where Appendix Q allows 16 to 18 inches. In this case, picked 18" as the maximum, again, because there is no other guidance in Appendix Q why something smaller might be required.
- 506.3.2.1: Requires ladders be capable of supporting 300 pound load on any rung, vs 200 in Appendix Q. 300 is consistent with load requirements in IBC Chapter 16.

The change to 1011.14 is for coordination with the new Section 506.3.3. In order to add to the list of allowed uses, there was a need to clarify whether alternating tread devices are allowed to provide access to unoccupied roofs to other than I-3 occupancies. Numbering the list is for clarity, taking the place of a long sentence with clauses separated by semicolons, and also clearly allows these for unoccupied roof access in other occupancies besides I-3s, consistent with the IBC Commentary. The change to 1015.2 and the new Exception 4 in 1015.3 integrate the sleeping loft guard provisions from IRC Appendix Q Section AQ104.2.5 into the guard provisions of the IBC, instead of having them reside in the sleeping loft section."

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase or decrease the cost of construction because the new sections to the code add an option and not a requirement. When and applicant decides to utilize these new sections, the code provides guidance on minimum standards for that space.

G112-21 Part III

G113-21

IBC: TABLE 506.2

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

2021 International Building Code

Revise as follows:

TABLE 506.2
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, S13D or SM, as applicable) IN SQUARE FEET[a, b]

Portions of table not shown remain unchanged.

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION											
		Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
R-1[h], R-2[h]	NS[d]	UL	UL	24,000	16,000	24,000	16,000	61,500	41,000	25,625	20,500	12,000	7,000
	S13R												
	S1	UL	UL	96,000	64,000	96,000	64,000	246,000	164,000	102,500	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	184,500	123,000	76,875	61,500	36,000	21,000
~~R-2[h]~~	~~NS[d]~~	~~UL~~	~~UL~~	~~24,000~~	~~16,000~~	~~24,000~~	~~16,000~~	~~61,500~~	~~41,000~~	~~25,625~~	~~20,500~~	~~12,000~~	~~7,000~~
	~~S13R~~												
	~~S1~~	~~UL~~	~~UL~~	~~96,000~~	~~64,000~~	~~96,000~~	~~64,000~~	~~246,000~~	~~164,000~~	~~102,500~~	~~82,000~~	~~48,000~~	~~28,000~~
	~~SM~~	~~UL~~	~~UL~~	~~72,000~~	~~48,000~~	~~72,000~~	~~48,000~~	~~184,500~~	~~123,000~~	~~76,875~~	~~61,500~~	~~36,000~~	~~21,000~~

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

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one *story above grade plane* equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable area in this chapter.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
d. The NS value is only for use in evaluation of existing *building area* in accordance with the *International Existing Building Code*.
e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the International Fire Code.
g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.
h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.
i. The maximum allowable area for a single-story nonsprinklered Group U *greenhouse* is permitted to be 9,000 square feet, or the allowable area shall be permitted to comply with Table C102.1 of Appendix C.

Reason Statement: This proposal is merely editorial and an attempt to clarify the code.
The allowable areas for Group R-1 and Group R-2 are identical. There is no reason for R-2 to be listed in a separate row.

This proposal simply combines the two rows and lists R-1 and R-2 together.

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

G113-21

G114-21

IBC: 506.2.2

Proponents: Jay Hyde, representing Sacramento Valley Association of Building Officials (jhyde@mogaveroarchitects.com)

2021 International Building Code

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.

For buildings with more than ~~three *stories*~~ *one story* *above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)] \quad \textbf{(Equation 5-3)}$$

A_a
= Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

> **Exception:** For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.2, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

Reason Statement: Three stories is confusing and redundant. The allowable increase for the number of stories, S_a, starts with the second story with the overall increase is, S_a, is 2 and ends with the third story where the allowable increase, S_a, is three.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Proposal is intended to clarify and simplify the code language.

G114-21

G115-21

IBC: 506.2.2

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies.

For buildings with more than three *stories above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)]$$ **(Equation 5-3)**

A_a
= Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

~~Exception~~ <u>Exceptions:</u>

1. <u>For buildings constructed in accordance with Section 510.2, the area of stories below the 3-hour rated horizontal assembly shall not be included in the total building area.</u>
2. For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories determined in accordance with Equation 5-3 based on the applicable provisions of Section 508.1, shall not exceed four.

Reason Statement: Section 506.2.2, which addresses the maximum total area (inclusive of all stories) in a building, does not address “podium” buildings that are constructed in accordance with the special provisions of IBC section 510.2. Specifically, the current text of 506.2.2 requires the inclusion of all stories above the grade plane to be included in the calculation.
However, buildings constructed in accordance with the special provisions of 510.2 may have one or more stories of type IA construction above the grade plane, and the allowable area for such stories is unlimited for most occupancies by table 506.2.

This code change proposal clarifies what has always been the intent of the code.

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

G115-21

G116-21

IBC: 506.3.2, TABLE 506.3.3, 506.3.3.1

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

2021 International Building Code

506.3 Frontage increase. Every building shall adjoin or have access to a *public way* to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Sections 506.3.1 through 506.3.3.

506.3.1 Minimum percentage of perimeter. To qualify for an area factor increase based on frontage, a building shall have not less than 25 percent of its perimeter on a *public way* or open space. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved *fire lane*.

Revise as follows:

506.3.2 Minimum frontage distance. To qualify for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance *(W)* of 20 feet (6096 mm) measured at right angles from the building face to any of the following:

1. The closest interior lot line.
2. The entire width of a street, alley or *public way*.
3. The exterior face of an adjacent building on the same property.

The frontage increase shall be based on the smallest *public way* or open space that is 20 feet (6096 mm) or greater, and the percentage of building perimeter having a minimum 20 feet (6096 mm) *public way* or open space. <u>Not all public ways or open spaces that are 20 feet (6096 mm) or greater are required to be used to determine the frontage increase.</u>

506.3.3 Amount of increase. The area factor increase based on frontage shall be determined in accordance with Table 506.3.3.

Revise as follows:

TABLE 506.3.3
FRONTAGE INCREASE FACTOR[a]

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)			
	~~0 to less than 20~~	20 to less than 25	25 to less than 30	30 or greater
0 to less than 25	~~0~~	0	0	0
25 to less than 50	~~0~~	0.17	0.21	0.25
50 to less than 75	~~0~~	0.33	0.42	0.50
75 to 100	~~0~~	0.50	0.63	0.75

a. Interpolation is permitted.

506.3.3.1 Section 507 buildings. Where a building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot (18 288 mm) *public way* or *yard* requirement, the area factor increase based on frontage shall be determined in accordance with Table 506.3.3.1. The frontage increase shall be based on the smallest public way or open space that is 30 feet (9144 mm) or greater, and the percentage of building perimeter having a minimum 30 feet (9144 mm) public way or open space. Not all public ways or open spaces that are 20 feet (6096 mm) or greater are required to be used to determine the frontage increase.

TABLE 506.3.3.1
SECTION 507 BUILDINGS[a]

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)					
	30 to less than 35	**35 to less than 40**	**40 to less than 45**	**45 to less than 50**	**50 to less than 55**	**55 ~~to less than 60~~ or greater**
0 to less than 25	0	0	0	0	0	0
25 to less than 50	0.29	0.33	0.38	0.42	0.46	0.50
50 to less than 75	0.58	0.67	0.75	0.83	0.92	1.00
75 to 100	0.88	1.00	1.13	1.25	1.38	1.50

a. Interpolation is permitted.

Reason Statement: This proposal provides some minor revisions to the new process of determining the frontage increase. We felt that additional clarification was needed for application. The proposed language does not change any technical provisions of the section.
The additional language is needed because there are situations where you can get a larger increase by not using all of the open space around the building.

For a couple examples:

1) A building with four sides open at 30', 35', 24' and 60'. The percentage of building perimeter open (>20') is 100%, with the smallest open space at 25 feet, my increase would be 0.50.

2) A building with three sides open at 30' 35' and 60', plus a short side that is not open. Assume the percentage of perimeter at least 20' open at 90%. With the smallest open space that is 20' or more being 30', my increase would be 0.75.

So I get a bigger increase with no yard than I do with a 24' yard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal is designed to clarify the requirement.

G116-21

G117-21

IBC: 507.3

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

507.3 Nonsprinklered, one-story buildings. The area of a Group F-2 or S-2 building not more than one*story* above *grade plane* of any *construction type,* ~~in height~~ shall not be limited where the building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: This change is making the language of Section 507.3 consistent with Section 507.4. No change in technical requirements.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The change is merely making the language of Section 507.3 consistent with Section 507.4.

G117-21

G118-21

IBC: 507.11

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

507.11 Group E buildings. The area of a Group E building not more than one *story above grade plane*, of Type II, III ~~IIIA~~ or IV construction, shall not be limited provided that the following criteria are met:

1. Each classroom shall have not less than two *means of egress*, with one of the *means of egress* being a direct exit to the outside of the building complying with Section 1022.
2. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: In Table 601, the hourly fire-resistance rating for bearing walls, both exterior and interior, in Type IIB construction is 0 hours. In Type IIIB construction, the hourly fire-resistance rating for exterior bearing walls is 2 hours and 0 hours for interior bearing walls. In Table 602, for Group E (Educational) occupancies, the most restrictive categories for exterior nonbearing walls and partitions have a 1-hour rating, based on fire separation distance. Yet, Type IIB allows for a 0-hour rating when the fire-separation distance is at least 10 feet but less than 30 feet.In other words, the hourly fire-resistance rating requirements for Type IIIB construction is just as, and in some cases, more restrictive when compared to Type IIB construction (i.e., 2 hours for exterior bearing walls in Type IIIB vs. 0 hours for Type IIB). However, Type IIB is allowed in this code provision, and Type IIIB is not. Finally, note that for Group A-3 buildings, Types II (507.6) and III (507.7) construction have essentially the same requirements with nearly identical language except that Type III has an additional requirement for ramps (507.7#3).Removing the “A” in this proposal will allow Type IIIB construction with its stronger hourly fire-resistance requirements, thus improving building and life safety for educational buildings and their occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change the current standard for Type II and Type IV construction. Those costs are constant for any who wish to continue building those types. The change from Type IIIA to Type III opens another option for designers.

G118-21

G119-21

IBC: 507.12

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

507.12 Motion picture theaters. In buildings of Type II or Type III construction, the area of a motion picture theater located on the first *story above grade plane* shall not be limited where the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason Statement: In Table 601, the most restrictive rating for bearing walls in Type II construction is 1 hour (Type IIA, exterior and interior). In Type III construction, the most restrictive rating for exterior bearing walls is 2 hours (in both Types IIIA and IIIB). In Table 602, for Group A (Assembly) occupancies, the most restrictive categories for exterior nonbearing walls and partitions have a 1-hour rating, based on fire separation distance**.**
In other words, the hourly fire-resistance rating requirements for Type III construction are just as, and in some cases, more restrictive compared to Type II construction (i.e., 2 hours for Type III vs. 1 hour for Type II).

Finally, note that for Group A-3 buildings, Types II (507.6) and III (507.7) construction have essentially the same requirements with nearly identical language except for Type III has an additional requirement for ramps (507.7#3).

Adding “Type III” to this exception will allow for exterior walls with higher hourly requirements, thus improving building and life safety for motion picture theaters and their occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change does not change that which is currently allowed. It gives another option, which is Type III

G119-21

G120-21

IBC: 507.14 (New)

Proponents: Valarie Evans, representing SNICC, SNBO (evansv@cityofnorthlasvegas.com)

2021 International Building Code

Add new text as follows:

507.14 **Noncombustible Carports.** The area of a noncombustible carport shall not be limited where the noncombustible carport is open on all sides, not more than ten feet (3,048 mm) in height, and provided with not less than a 5 feet (1,524 mm) fire separation distance on all sides.

Reason Statement: This proposal allows noncombustible carports to be permitted of unlimited area when certain conditions are met. It permits a reduction in the separation distance from 10 feet to 5 feet.
Per the 2021 IBC Sections 406.3.1 and 406.3.2, a carport may be classified as either a Group U or Group S-2 occupancy. As a Group S-2 occupancy, a noncombustible carport is required to have a minimum fire separation distance of 10 feet in order to be exempt from rated exterior walls and protected opening requirements (i.e. permitted to be open on all sides). If classified as a Group U occupancy, this exemption only applies where a fire separation distance of 30 feet or greater is provided (for non-sprinklered structures).

The minimum separation distance requirements noted above are excessive when applied to these structures. This is primarily because the hazards associated with noncombustible carports having a minimum separation distance of 5 feet and not exceeding 10 feet in height are less than those of an unlimited row of parked automobiles that could otherwise be located immediately adjacent to either a property line or building. The addition of a noncombustible covering over the automobiles poses no additional hazard to adjacent buildings since the fire loads are essentially identical (i.e. whether covered or not).

The ten feet height limitation further limits the application of this provision to noncombustible carports that serve passenger vehicles, as opposed to larger commercial vehicles, travel trailers or similar. Where no carport is present, all vehicles (including larger commercial vehicles and travel trailers) can be parked immediately adjacent to a property line or building without restriction.

The purpose of allowing these structures to be of unlimited area is essentially the same as the justification pertaining to the 5 feet separation distance. The combination of the noncombustible construction, ten feet height limitation and open on all sides present no additional fire load or associated risks to these structures, their occupants or adjacent buildings.

Adoption of this section will likely result in increased site density since the setbacks for carports can be reduced from either 30 feet or 10 feet down to 5 feet. This will be useful on low-income housing projects where limited funds and land costs are at a premium.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No impact on cost of construction, although it could be used to significantly reduce the cost per square foot of projects by increasing overall site density.

G120-21

G121-21

IBC: 302.1, 403.1, 406.2.8, 406.3.2, 406.5.3, 406.5.4, 407.1.1(New), 415.6.4(New), TABLE 415.6.4(New), [F]415.9.1.1, [F]428.3.1, 504.2, 506.2.2, 506.2.2.1, SECTION 508, 508.1, 508.2, 508.2.1, 508.2.2, 508.2.3, 508.2.4, 508.3, 508.3.1, 508.3.1.1, 508.3.1.2, 508.3.2, 508.3.3, 508.4, TABLE 508.4, 508.4.1, 508.4.2, 508.4.3, 508.4.4, 508.4.4.1, 507.1.1, 507.4.1, 510.4, 510.7.1, 707.3.9, 711.2.4.1, SECTION C103, C103.1

Proponents: Shane Nilles, City of Cheney, WA, representing Self (snilles@cityofcheney.org)

2021 International Building Code

Revise as follows:

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

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

SECTION 403 HIGH-RISE BUILDINGS.

Revise as follows:

403.1 <u>General</u> ~~Applicability~~. *High-rise buildings* shall comply with Sections 403.2 through 403.6. <u>Where high-rise buildings contain mixed use and occupancies, the most restrictive provisions of this section shall apply throughout the fire area of the high-rise building or portion thereof.</u>

Exceptions: The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.2.
2. *Open parking garages* in accordance with Section 406.5.
3. The portion of a building containing a Group A-5 occupancy in accordance with Section 303.6.
4. Special industrial occupancies in accordance with Section 503.1.1.
5. Buildings containing any one of the following:
   - 5.1. A Group H-1 occupancy.
   - 5.2. A Group H-2 occupancy in accordance with Section 415.8, 415.9.2, 415.9.3 or 426.1.
   - 5.3. A Group H-3 occupancy in accordance with Section 415.8.

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES.

Revise as follows:

406.3.2 Separation. For other than *private garages* adjacent to dwelling units, the separation of *private garages* from other occupancies shall comply with Section <u>406.2.8</u>~~508~~. Separation of *private garages* from *dwelling units* shall comply with Sections 406.3.2.1 and 406.3.2.2.

406.5.3 Mixed occupancies and uses. Mixed uses shall be allowed in the same building as an *open parking garage* subject to the provisions of

Sections 402.4.2.3, 406.5.11, 504.2, 506.2.2, ~~508.1,~~ 510.3, 510.4 and 510.7.

406.5.4 Area and height. Area and height of *open parking garages* shall be limited as set forth in Chapter 5 for Group S-2 occupancies ~~and as further provided for in Section 508.1~~.

SECTION 407 GROUP I-2.

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES.

Revise as follows:

504.2 Mixed occupancy. In a building containing mixed occupancies ~~in accordance with Section 508~~, no individual occupancy shall exceed the height and number of *story* limits specified in this section for the applicable occupancies.

Exception: Accessory occupancies with an aggregate area that does not exceed 10% of the floor area of the story in which they are located, and does not exceed the tabular values for nonsprinklered buildings in Table 506.2 for such occupancy, the allowable height and number of stories of the accessory occupancy is permitted to be evaluated as part of one of the other occupancies on that story.

407.1.1 Group I-2, Condition 2 occupancies. The most restrictive requirements of Section 407, 509, and 712 shall apply throughout the entire fire area containing the Group I-2 occupancy. The most restrictive requirements of Chapter 10 shall apply to the path of egress from the Group I-2, Condition 2 occupancy up to and including the exit discharge.

SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5.

415.6.4 Mixed-occupancies. Where located in the same building H-2, H-3, H-4, and H-5 occupancies shall each be individually separated from the rest of the building by fire barriers constructed in accordance with Section 707, horizontal assemblies constructed in accordance with Section 711, or combination thereof having a fire-resistance rating of no less than required by Table 415.6.4. H-1 shall not be located in buildings containing any other occupancies or uses.

Add new text as follows:

TABLE 415.6.4
SEPARATION OF GROUP H OCCUPANCIES (HOURS)

OCCUPANCY	H-2	H-3, H-4	H-5
A, E, I, R, F-2, S-2	3	2	2
B, F-1, M, S-1	2	1	1
H-2	N	1	1
H-3, H-4	1	1[a]	1
H-5	1	1	N

N = No separation requirement

a. Separation is not required between occupancies of the same classification.

Revise as follows:

[F] 415.9.1.1 Mixed occupancies. Where the storage tank area is located in a building of two or more occupancies and the quantity of liquid exceeds the maximum allowable quantity for one *control area*, the use shall be completely separated from adjacent occupancies in accordance with the requirements of Section 415.6.4~~508.4~~.

SECTION 428 HIGHER EDUCATION LABORATORIES.

Revise as follows:

[F] 428.3.1 Separation from other nonlaboratory areas. *Laboratory suites* shall be separated from other portions of the building with fire barriers or horizontal assemblies as required in Table 428.3. Fire barriers shall be constructed in accordance with Section 707 and horizontal assemblies constructed in accordance with Section 711.~~in accordance with the most restrictive of the following~~:

> **Exception:** Where an individual laboratory suite occupies more than one story, the fire-resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of this code.

1. ~~*Fire barriers* and *horizontal assemblies* as required in Table 428.3. *Fire barriers* shall be constructed in accordance with Section 707 and *horizontal assemblies*constructed in accordance with Section 711.~~

   ~~**Exception:** Where an individual*laboratory suite*occupies more than one *story*, the *fire-resistance rating* of intermediate floors contained within the *laboratory suite*shall comply with the requirements of this code.~~

2. ~~Separations as required by Section 508.~~

SECTION 506 BUILDING AREA.

Revise as follows:

506.2.2 Mixed-occupancy buildings. The allowable area of each *story* of a mixed-occupancy building shall be determined in accordance with Section 506.2.2.1~~the applicable provisions of , Section 508.3.2 for nonseparated occupancies and Section 508.4.2 for separated occupancies~~.

For buildings with more than three *stories above grade plane,* the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such stories, determined in accordance with Equation 5-3 based on the ~~applicable~~ provisions of Section 506.2.2.1~~508.1~~, shall not exceed three.

$$A_a = [A_t + (NS \times I_f)] \quad \textbf{(Equation 5-3)}$$

A_a
= Allowable area (square feet).

A_t = Tabular allowable area factor (NS, S13R, S13D or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for a nonsprinklered building, regardless of whether the building is sprinklered.
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

> **Exception:** For buildings ~~designed as separated occupancies under Section 508.4 and~~ equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.2, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* determined in accordance with Equation 5-3 based on the ~~applicable~~ provisions of Section 506.2.2.1~~508.1~~, shall not exceed four.

Add new text as follows:

506.2.2.1 Mixed-occupancy, stories. Where a building story contains more than one occupancy group, each portion of the building story shall be individually classified in accordance with Section 302.1. In each story, the building area shall be such that the sum of the rations of the actual building area of each occupancy divided by the allowable building area of each occupancy shall not exceed 1.

Exception: Accessory occupancies with an aggregate area that does not exceed 10% of the floor area of the story in which they are located, and does not exceed the tabular values for nonsprinklered buildings in Table 506.2 for such occupancy, the area of the accessory occupancy is permitted to be included as part of the area for one of the other occupancies on that story.

Revise as follows:

~~506.2.2.1~~ 506.2.2.1.1 Group H-2 or H-3 mixed occupancies. For a building containing Group H-2 or H-3 occupancies, the allowable area shall be determined in accordance with Section506.2.2.1~~508.4.2~~, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.

SECTION 507 UNLIMITED AREA BUILDINGS.

Revise as follows:

507.1.1 Accessory occupancies. Accessory occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 504.2 and 506.2.2~~508.2~~, otherwise the requirements of Sections 507.3 through 507.13 shall be applied, where applicable.

507.4.1 Mixed occupancy buildings with Groups A-1 and A-2. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.4, provided that the following criteria are met:

1. Group A-1 and A-2 occupancies are separated from B, F, M, or S occupancies with 2-hour rated fire barriers or horizontal assemblies. Fire barriers shall be constructed in accordance with Section 707 and horizontal assemblies shall be constructed in accordance with Section 711 ~~as required for separated occupancies in Section 508.4.4 with no reduction allowed in the *fire-resistance rating* of the separation based upon the installation of an *automatic sprinkler system*~~.
2. Each area of the portions of the building used for Group A-1 or A-2 occupancies shall not exceed the maximum allowable area permitted for such occupancies in Section 503.1.
3. *Exit* doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.

Delete without substitution:

~~SECTION 508 MIXED USE AND OCCUPANCY~~.

~~508.1 General~~. ~~Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3, 508.4 or 508.5, or a combination of these sections.~~

~~Exceptions:~~

1. ~~Occupancies separated in accordance with Section 510.~~
2. ~~Where required by Table 415.6.5, areas of Group H-1, H-2 and H-3 occupancies shall be located in a *detached building* or structure.~~

~~508.2 Accessory occupancies.~~ ~~Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4.~~

~~508.2.1 Occupancy classification~~. ~~Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.~~

~~508.2.2 Allowable building height.~~ ~~The allowable height and number of *stories* of the building containing accessory occupancies shall be in accordance with Section 504 for the main occupancy of the building.~~

~~508.2.3 Allowable building area.~~ ~~The allowable area of the building shall be based on the applicable provisions of Section 506 for the main occupancy of the building. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the *story* in which they are located and shall not exceed the tabular values for nonsprinklered buildings in Table 506.2 for each such accessory occupancy.~~

~~508.2.4 Separation of occupancies.~~ ~~No separation is required between accessory occupancies and the main occupancy.~~

~~Exceptions:~~

1. ~~Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.~~
2. ~~Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.~~

~~**508.3 Nonseparated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.~~

~~**508.3.1 Occupancy classification.** Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that apply to the nonseparated occupancies shall apply to the total nonseparated occupancy area.~~

~~**508.3.1.1 High-rise buildings.** Where nonseparated occupancies occur in a *high-rise building*, the most restrictive requirements of Section 403 that apply to the nonseparated occupancies shall apply throughout the *high-rise building.*~~

~~**508.3.1.2 Group I-2, Condition 2 occupancies.** Where one of the nonseparated occupancies is Group I-2, Condition 2, the most restrictive requirements of Sections 407, 509 and 712 shall apply throughout the *fire area* containing the Group I-2 occupancy. The most restrictive requirements of Chapter 10 shall apply to the path of egress from the Group I-2, Condition 2 occupancy up to and including the *exit discharge.*~~

~~**508.3.2 Allowable building area, height and number of stories.** The allowable *building area, height* and number of *stories* of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.~~

~~**508.3.3 Separation.** No separation is required between nonseparated occupancies.~~

~~**Exceptions:**~~

1. ~~Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.~~
2. ~~Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.~~

~~**508.4 Separated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.~~

~~**TABLE 508.4**~~

~~**REQUIRED SEPARATION OF OCCUPANCIES (HOURS)[f]**~~

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

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

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

~~N = No separation requirement.~~

~~NP = Not Permitted.~~

~~a. See Section 420.~~

~~b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.~~

~~c. See Sections 406.3.2 and 406.6.4.~~

~~d. Separation is not required between occupancies of the same classification.~~

~~e. See Section 422.2 for *ambulatory care facilities*.~~

~~f. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring fire protection systems shall also comply with Section 707.3.10 and Table 707.3.10 in accordance with Section 901.7.~~

~~**508.4.1 Occupancy classification.** Separated occupancies shall be individually classified in accordance with Section 302.1. Each separated space shall comply with this code based on the occupancy classification of that portion of the building. The most restrictive provisions of Chapter 9 that apply to the separate occupancies shall apply to the total nonfire-barrier-separated occupancy areas. Occupancy separations that serve to define *fire area* limits established in Chapter 9 for requiring a *fire protection system* shall also comply with Section 901.7.~~

~~**508.4.2 Allowable building area.** In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each separated occupancy divided by the allowable *building* area of each separated occupancy shall not exceed 1.~~

~~**508.4.3 Allowable building height and number of stories.** Each separated occupancy shall comply with the *building height limitations* and *story* limitations based on the type of construction of the building in accordance with Section 503.1.~~

> ~~**Exception:** Special provisions of Section 510 shall permit occupancies at *building heights* and number of *stories* other than provided in Section 503.1.~~

~~**508.4.4 Separation.** Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.~~

~~**508.4.4.1 Construction.** Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. *Mass timber* elements serving as *fire barriers* or *horizontal assemblies* to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^1/_2$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.~~

SECTION 510 SPECIAL PROVISIONS.

Revise as follows:

510.4 Parking beneath Group R. Where a maximum one *story above grade plane* Group S-2 parking garage, enclosed or open, or combination thereof, of Type I construction or open of Type IV construction, with grade entrance, is provided under a building of Group R, the number of *stories* to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a *fire-resistance rating* not less than 2 hours~~the mixed occupancy separation required in Section 508.4~~.

Exception: Where permitted by the type of construction, the floor assembly shall be permitted to be reduced to 1-hour provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

510.7.1 Fire separation. The parking occupancy shall be separated from the upper occupancy by 2-hour rated fire barriers or horizontal assemblies. *Fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711~~ between the parking occupancy and the upper occupancy shall correspond to the required *fire-resistance rating* prescribed in Table 508.4 for the uses involved~~. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking structure, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. *Means of egress* for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by *fire barriers* having not less than a 2-hour *fire-resistance rating* as required by Section 707 with *self-closing* doors complying with Section 716 or *horizontal assemblies* having not less than a 2-hour *fire-resistance rating* as required by Section 711, with *self-closing* doors complying with Section 716. *Means of egress* from the *open parking garage* shall comply with Section 406.5.

Exception: Where permitted by the type of construction, the separation between the parking occupancy and the upper occupancy shall be permitted to be reduced to 1-hour provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

SECTION 707 FIRE BARRIERS.

Revise as follows:

~~**707.3.9 Separated occupancies.** Where the provisions of Section 508.4 are applicable, the *fire barrier* separating mixed occupancies shall have a *fire-resistance rating* of not less than that indicated in Table 508.4 based on the occupancies being separated.~~

SECTION 711 FLOOR AND ROOF ASSEMBLIES.

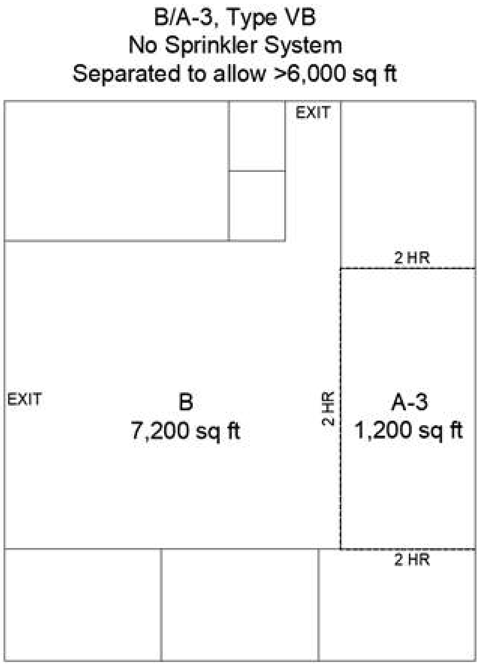
Revise as follows:

~~**711.2.4.1 Separating mixed occupancies.** Where the *horizontal assembly* separates mixed occupancies, the assembly shall have a *fire-resistance rating* of not less than that required by Section 508.4 based on the occupancies being separated.~~

~~**SECTION C103 MIXED OCCUPANCIES.**~~

~~**C103.1 Mixed occupancies.** Mixed occupancies shall be protected in accordance with Section 508.~~

Reason Statement: The way mixed-occupancy buildings are currently addressed for allowable area is confusing, misleading, commonly misapplied, and arbitrary. Designers are forced to analyze the building multiple ways and do multiple presentations on the cost of construction for each option and limitations in future building expansions. In unfortunate scenarios, designers, builders, and officials may even be misled to believe that the “separated” option is the only option, leading to a network of fire-rated separations, including all associated opening protectives, to be put into place where the “non-separated” option would work without even coming close to the maximum allowable area, which is a substantial penalty that is not necessary. Even more alarming is scenarios where a code user misapplies 508 to extend beyond its purpose, which is allowable height and area only, and uses it to justify not providing proper separations for “fire areas” or otherwise uses it to avoid sprinklers or fire alarms where they actually would be needed. More importantly, having two options, separated and nonseparated, is unnecessary as a single option can provide a logical allowable area without requiring separations that serve no actual life/safety function. As an example, a building that contains B/A-3 occupancies, non-sprinkled, Type VB construction, in order to be larger than the 6,000 square feet restriction where the non-separated option is used, the separated option requires a 2hr fire barrier between the B and A-3. Looking at the illustration below the question is, what does the fire barrier achieve? Are we protecting the occupants in the A-3 that are going to exit out through the B? Are we concerned about the storage of combustibles that wouldn’t actually occur in the A-3? How is the expense of the fire barrier in terms of materials, extra construction and design time to address all details therefore, and the cost to install and maintain all opening protectives justified in order to allow the allowable area to be ratio based, which logically should apply without any arbitrary separation? It makes sense to not penalize the building and code user.



This proposal simplifies and corrects these issues by taking height/area provisions from 508 and redistributing to 504.2 (new exception) and a new Section 506.2.2.1 which will govern limitations to all mixed occupancy buildings' height and area by allowing ratio method for allowable area, without the unnecessary separations, and providing for "accessory occupancies" as a permissible exception as appropriate. Additionally, there are many provisions that are currently in 508 that are unrelated to height and area, or are better located elsewhere in the code. This proposal relocates those provisions so that the information is in the place where the user is initially looking, and therefore prevents further misinterpretation:

-302.1 (Occupancy classification), edited to remove no longer needed reference to 508.

- 508.2.4 exception #1 (requirement for H-2, H-3, H-4 and H-5 to always be separated from other occupancies) relocated as charging language in new section 415.6.4 and new table 415.6.4 (415 is H occupancy provisions)

- 508.3.1.1 (high-rise building provisions), provisions are moved to section 403.1 (403 is high-rise building provisions)

- 508.3.1.2 (Group I-2, Condition 2 occupancy provisions), provisions are moved to new section 407.1.1 (407 is Group I-2 provisions)

- 406.2.8 (mixed occupancies with garages), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 406.3.2 (Non-private garage provisions), edited to remove no longer needed reference to 508.

- 406.5.3 (Mixed use building with open parking garages), edited to change the pointer from 508 to the new provision location of 504.2 and 506.2.

- 406.5.4 (Area and height of open parking garages), edited to remove no longer needed reference to 508.

- 428.3.1 (Separation from other nonlaboratory areas), edited to removed no longer needed reference to 508.

- 507.1.1 (Accessory occupancies in unlimited are buildings), edited to change the pointer from 508 to the new provision location of 504.2 and 506.2.

-507.4.1 (Unlimited size mixed occupancy buildings with Groups A-1 and A-2), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508.

- 510.4 (Special Height/Area provisions with parking beneath Group R), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 510.7.1 (Special Height/Area provisions with open parking below provisions), edited to specify 2 hour separation as is currently otherwise required by its pointing to 508 with exception for 1 hour if NFPA 13 system throughout.

- 707.3.9 (Fire barriers separating mixed occupancies pointer), deleted entirely as it is only a reference to 508.

- 711.2.4.1 (Horizontal assemblies separating mixed occupancies pointer), deleted entirely as it is only a reference to 508.

- C103 and C103.1 (Mixed occupancies in agricultural buildings), deleted entirely as it is only a reference to 508.

Any situation where the code is not correctly applied leads to frustration, lack of proper life/safety features, and unnecessary costs; this proposal will lead to more consistent application of the codes which will prevent those issues.

There is a correlative change to move Section 508.5 back to Section 419 where it was in 2018 IBC.

Cost Impact: The code change proposal will decrease the cost of construction
There is a reduction in cost of construction for mixed use buildings in cases where rated separations will no longer be required to use the ratio-calculation for allowable area.

G121-21

G122-21 Part I

PART I - IBC: 508.4.4.1, 509.4.1.1
PART II - IBC: 2603.4

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

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

2021 International Building Code

Revise as follows:

508.4.4.1 Construction. Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. ~~*Mass timber* elements serving as *fire barriers* or *horizontal assemblies* to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^{1}/_{2}$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.~~

Delete without substitution:

~~**509.4.1.1 Type IV-B and IV-C construction.** Where Table 509.1 specifies a fire-resistance-rated separation, *mass timber* elements serving as *fire barriers* or *horizontal assemblies* in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^{1}/_{2}$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.~~

G122-21 Part I

G122-21 Part II

PART II - IBC: 2603.4

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

2021 International Building Code

Revise as follows:

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of $^1/_2$-inch (12.7 mm) *gypsum wallboard*, *mass timber* or heavy timber in accordance with Section 2304.11 ~~602.4~~ or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. Combustible concealed spaces shall comply with Section 718.

Reason Statement: This code proposal attempts to fix something that slipped through the cracks and is now broken and confusing in Sections 508 and 509. It also updates section 2603.4 to be consistent with the definition of mass timber now found in Section 202 and clarifies the reference to heavy timber in 602.4 is now found in Section 2304.11.
The ad hoc committee on tall wood buildings did an outstanding job developing and submitting code changes to create three new types of construction: Types IV-A, IV-B and IV-C.

One of their proposals, G89-18, was developed at he last minute and flawed, but was still ultimately approved as modified. The modification somewhat fixed the change but did so in a way that just seems to create confusion and complicate the applicable portions of Sections 508 and 509 with no real benefit.

G89-18 as submitted required a thermal barrier such as 1/2" gypsum board or a "noncombustible equivalent" to cover up exposed wood in Type IV B or C construction when the mass timber is used as a fire barrier or horizontal assembly for separated uses or when serving as a fire barrier or horizontal assembly on the interior of incidental uses. The whole purpose of having exposed mass timber is to have exposed mass timber. The only place in Type IV B construction that exposed mass timber is allowed is where it is limited in area, and physically separated a distance away from other exposed mass timber far enough so that the exposed mass timber will burn out when the content burns out. Covering the exposed mass timber with 1/2" gypsum or a noncombustible equivalent kind of defeats the purpose of having exposed mass timber.

The reason statement for G89-18 stated the concern from the tall wood ad hoc committee: "The concern is that without any modifications to these provisions regulating separated occupancies and incidental uses, a fire barrier or horizontal assembly could be designed using mass timber that could comply with the fire resistance rating, but which would allow any exposed mass timber to contribute to the fuel load. This can occur in Types IV-B and IV-C construction." The reason statement for G89-18 went on to explain the intent to have the thermal barrier delay or prevent the ignition of the mass timber (that is definition of noncombustible protection not thermal barriers) and the reason statement also said the thermal barrier only needs to cover the exposed mass timber (which would make it no longer exposed???). It begs the question why provisions were developed allowing exposed mass timber.

G89-18 was approved as modified to become the current 2021 IBC language by incorporating a standard used for thermal barriers elsewhere in the code instead of as was originally proposed by the tall wood ad hoc committee. The code committee reason stated the modification "makes the proposal consistent with the current code". The language contained in the modification requires an alternate to 1/2" gypsum board specified for the thermal barrier to be a "material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275" .

When one searches the current code to see where this requirement for the stated NFPA 275 criteria for a thermal barrier is located, one need go no farther than section 2603.4 where thermal barriers are required to cover foam plastic insulation. In that section 1/2" gypsum **or heavy timber** is allowed to serve as a thermal barrier covering foam plastic insulation. In 2603.4.1.6, even 1/4" wood structural panel is deemed to comply to cover foam plastic in attics in lieu of a thermal barrier.

In Types IV-A, B and C construction foam plastic is not even allowed on the inside or the outside of the building as noncombustible protection is required. Mass timber is heavy timber by definition in Section 202.

Why do we need to protect something with a thermal barrier that is deemed to serve equivalently in other sections of the code as a thermal barrier? And this being required when the thing we typically protect from (foam plastic) is not even allowed in the Type IV-A, IV-B or IV-C construction in 602.4. Since heavy timber is allowed to serve equivalently as a thermal barrier why can't exposed mass timber protect itself? Why were these changes in G89-18 as submitted or as modified even needed?

The original code proposal reason said the tall wood building committee was worried about contribution of the mass timber to the fuel load.

Full scale tests were conducted for Type IV B construction at the ATF lab where the exposed wood area was limited and separated to show when limited it does not adversely contribute to the fuel. Numberous E-119 tests have been performed of exposed mass timber to show conformity with fire resistance rating as well as other methods allowed in the code to determine the fire resistance rating. The ATF lab testing also had a light frame noncombustible wall in the assembly clearly showing a single layer of 1/2" gypsum placed on nonbearing walls disappeared rapidly when the content fire burns without sprinkler protection. The testing also showed how the portions of unexposed wood protected with at least 2 layers of 5/8" type x gypsum or equivalent (noncombustible protection) was adequate to prevent or limit contribution of the mass timber to the fire load. In order to establish a base line as part of the ATF tests the contents were first covered 100% with 2 layers of 5/8" gypsum and the contents burned out. Then the test was run later with limited areas exposed again allowing the contents and exposed wood to burn out. The limited exposed areas in Type IV-B did not substantially increase the fire output and the combustion burned out even when first generation mass timber was used (the second generation mass timber adhesive now required performs better).

In Type IVC construction the mass timber is required to be of 2 hour construction but is allowed to be exposed throughout all areas except stair enclosures, shafts and concealed spaces as long as flame spread is met. Type IV-C was justified by the two hour fire resistance rating and by limited the height to that of Type IV HT.

Covering limited exposed mass timber in IV-B or some or all exposed mass timber in IV-C with 1/2" gypsum accomplishes nothing. There is no foam plastic to thermally protect and contribution of the mass timber was already addressed.

When exposed mass timber requires a fire resistance rating in Type IV-B and IV-C construction as a fire barrier or a horizontal assembly by definition in Section 202 in Sections 508 and 509 fire barriers and horizontal assemblies are serving to restrict the spread of fire as found in the definition and applicable sections. Change in temperature on the non fire side and lack of ignition of cotton waste acceptance criteria in E-119 or other applicable methods in Section 703.3 must be met to restrict the spread of fire in addition to the structural fire resistance requirement.

We are all grateful for the work the ad hoc committee did to develop tall wood provisions.

Again, this code proposal attempts to fix something that slipped through the cracks and is now broken and confusing in Sections 508 and 509. It also updates section 2603.4 to be consistent with the definition of mass timber now found in Section 202 and clarifies the reference to heavy timber in 602.4 is now found in Section 2304.11.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal eliminates code language that is confusing.

G122-21 Part II

G123-21

IBC: 508.4.4.1, 509.4.1.1

Proponents: Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Revise as follows:

508.4.4.1 Construction. Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. Mass timber elements serving as fire barriers or horizontal assemblies to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an approved thermal barrier consisting of gypsum board that is not less than 1/2 inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

Exception: The thermal barrier shall not be required on the top of horizontal assemblies serving as occupancy separations.

509.4.1.1 Type IV-B and IV-C construction. Where Table 509.1 specifies a fire-resistance-rated separation, mass timber elements serving as fire barriers or horizontal assemblies in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of gypsum board that is not less than 1/2 inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

Exception: The thermal barrier shall not be required on the top of horizontal assemblies serving as incidental use separations.

Reason Statement: The ICC Ad Hoc Committee on Tall Wood Buildings' intent for these provisions was to prohibit exposed mass timber elements in required occupancy and incidental use separations so that under fire conditions the separation would not contribute to the fuel load. However, when a fire-resistance rated horizontal assembly serves as an occupancy separation, the horizontal assembly is typically rated for exposure from the underside. There is no specific protection required on the top of the floor for horizontal assemblies of conventional framing of wood or other materials since there is no thermal barrier requirement for them (unless the assembly contains foam plastic). Mass timber floors (typically cross-laminated timber several inches thick) represents a lesser hazard in these circumstances than a conventional framed floor. Therefore, the protection should be required only on the underside of rated mass timber horizontal assemblies and is unnecessary on the top of floors. The proposed exception does not negate the requirement for one inch of noncombustible material on the top of mass timber floors in Type IV-B.

Cost Impact: The code change proposal will decrease the cost of construction
May decrease the cost of construction. Noncombustible or other protection on the top of floors in required separations will not be required in some circumstances where it currently may be.

G123-21

G124-21

IBC: SECTION 419, 419.1, 508.5, 508.5.1, 508.5.2, 508.5.3, 508.5.4, 508.5.5, 508.5.6, 508.5.7, 508.5.8, 508.5.9, 508.5.10, 508.5.11

Proponents: Shane Nilles, City of Cheney, WA, representing Self (snilles@cityofcheney.org)

Information note: This proposal deletes all sections from 508.1 to 508.4.4.1 and relocates the provisions. Section 508.5 is relocated to Section 419 - where it was located in the 2018 edition of the code. The end result is that Section 508 is deleted.

2021 International Building Code

Add new text as follows:

SECTION 419 LIVE/WORK UNITS.

Revise as follows:

419.1 ~~508.5~~ General~~Live/work units~~. A *live/work unit* shall comply with Sections 419.1 ~~508.5~~ through 419.9 ~~508.5.11~~.

> **Exception:** *Dwelling or sleeping units* that include an office that is less than 10 percent of the area of the dwelling or sleeping unit ~~are permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2~~.

419.1.1 ~~508.5.1~~ Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

419.2 ~~508.5.2~~ Occupancies. *Live/work units* shall be classified as a Group R-2 occupancy. Separation requirements found in Section~~s~~ 420 ~~and 508~~ shall not apply within the *live/work unit* where the *live/work unit* is in compliance with Section 419 ~~508.5~~. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a *live/work unit.*

> **Exception:** Storage shall be permitted in the *live/work unit* provided that the aggregate area of storage in the nonresidential portion of the *live/work unit* shall be limited to 10 percent of the space dedicated to nonresidential activities.

419.3 ~~508.5.3~~ Means of egress. Except as modified by this section, the*means of egress* components for a *live/work unit* shall be designed in accordance with Chapter 10 for the function served.

419.4 ~~508.5.4~~ Egress capacity. The egress capacity for each element of the*live/work unit* shall be based on the *occupant load* for the function served in accordance with Table 1004.5.

419.5 ~~508.5.5~~ Spiral stairways. *Spiral stairways* that conform to the requirements of Section 1011.10 shall be permitted.

419.6 ~~508.5.6~~ Vertical openings. Floor openings between floor levels of a*live/work unit* are permitted without enclosure.

[F] 419.7 ~~508.5.7~~ Fire protection. The*live/work unit* shall be provided with a monitored *fire alarm* system where required by Section 907.2.9 and an *automatic sprinkler system* in accordance with Section 903.2.8.

419.8 ~~508.5.8~~ Structural. Floors within a*live/work unit* shall be designed for the *live loads* in Table 1607.1, based on the function within the space.

419.9 ~~508.5.9~~ Accessibility. *Accessibility* shall be designed in accordance with Chapter 11 for the function served.

419.10 ~~508.5.10~~ Ventilation. The applicable*ventilation* requirements of the *International Mechanical Code* shall apply to each area within the *live/work unit* for the function within that space.

419.11 ~~508.5.11~~ Plumbing facilities. The nonresidential area of the*live/work unit* shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the *live/work unit* is required to be accessible by Section 1108.6.2.1, the plumbing fixtures specified by Chapter 29 shall be accessible.

SECTION ~~419~~ 429 ARTIFICIAL DECORATIVE VEGETATION.

[F] ~~419.1~~ 429.1 Artificial decorative vegetation. Artificial decorative vegetation exceeding 6 feet (1830 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building, or on the roof of a building, shall comply with Section 321.1 of the *International Fire Code.*

> **Exception:** Artificial decorative vegetation located more than 30 feet (9144 mm) from the *exterior wall* of a building.

Reason Statement: Live/work units was relocated last cycle from Section 419 to 508.5. This was part of an attempt to eliminate Chapter 4. Live/work units are Group R-2 without a separation between a person's living and work space. They should not be under Section 508, Mixed Use Buildings. They should be relocated back to Section 419.
The new section for Artificial Vegetation that was inserted in place of Section 419 is being relocated to the end of Chapter 4.
There is a correlative change to delete/relocate the rest of Section 508. This proposal would coordinate, or it could stand on it's own.

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

G124-21

G125-21

IBC: 508.5, 508.5.6

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

2021 International Building Code

Revise as follows:

508.5 Live/work units. A *live/work unit* shall comply with Sections ~~508.5~~ 508.5.1 through 508.5.11. Live/work units complying with the requirements of Section 508.5.1 through 508.5.11 for the non-residential portion of the unit and that are within the scope of the *International Residential Code*, shall be permitted to be constructed in accordance with this code or the *International Residential Code*.

Exception: *Dwelling or sleeping units* that include an office that is less than 10 percent of the area of the *dwelling unit* ~~are~~ shall be permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2.

508.5.1 Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

508.5.2 Occupancies. *Live/work units* shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the *live/work unit* where the *live/work unit* is in compliance with Section 508.5. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a *live/work unit*.

Exception: Storage shall be permitted in the *live/work unit* provided that the aggregate area of storage in the nonresidential portion of the *live/work unit* shall be limited to 10 percent of the space dedicated to nonresidential activities.

508.5.3 Means of egress. Except as modified by this section, the *means of egress* components for a *live/work unit* shall be designed in accordance with Chapter 10 for the function served.

508.5.4 Egress capacity. The egress capacity for each element of the *live/work unit* shall be based on the *occupant load* for the function served in accordance with Table 1004.5.

508.5.5 Spiral stairways. *Spiral stairways* that conform to the requirements of Section 1011.10 shall be permitted.

Revise as follows:

508.5.6 Vertical openings. Floor openings between floor levels of a *live/work unit* ~~are~~ shall be permitted without enclosure.

[F] 508.5.7 Fire protection. The *live/work unit* shall be provided with a monitored *fire alarm* system where required by Section 907.2.9 and an *automatic sprinkler system* in accordance with Section 903.2.8.

508.5.8 Structural. Floors within a *live/work unit* shall be designed for the *live loads* in Table 1607.1, based on the function within the space.

508.5.9 Accessibility. *Accessibility* shall be designed in accordance with Chapter 11 for the function served.

508.5.10 Ventilation. The applicable *ventilation* requirements of the *International Mechanical Code* shall apply to each area within the *live/work unit* for the function within that space.

508.5.11 Plumbing facilities. The nonresidential area of the *live/work unit* shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the *live/work unit* is required to be accessible by Section 1108.6.2.1, the plumbing fixtures specified by Chapter 29 shall be accessible.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The intent of the proposal is to coordinate the IRC and IBC scoping. IRC Section 101.2 Exception 1 allows for live/work units to be constructed under the IRC. However, the IBC does not state this option in IBC Section 101.2 or this section.

During the discussions, there were concerns that the current requirements for complying with the IRC and the IBC could be a conflict for several of the items listed, such as means of egress, fire protection, structural and accessibility. The addition of 'for the non-residential portion of the unit' should help clarify that the means of egress, fire protection, structural loading and plumbing facilities for the business/mercantile portion of the unit needs to look at the IBC for requirements.

This is one of a group of proposals intended to coordinate the scoping items in IBC Section 101.2 and IRC 101.2. While the proposals work together, then also work separately. The proposal for coordination will be in Group B.
This proposal is submitted by the ICC Building Code Action Committee (BCAC).

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a coordination of scoping requirements and references in the IBC and IRC, not a change to construction requirements.

G125-21

G126-21 Part I

PART I – IBC: 508.5
PART II – IBC[F] 508.5.7

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

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

2021 International Building Code

Revise as follows:

508.5 Live/work units. In addition to other requirements of this code ~~A~~ *live/work* ~~*unit*~~ *units* shall comply with Sections 508.5 through 508.5.11.

~~Exception~~ Exceptions:

1. Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit are permitted to be classified as dwelling units with accessory occupancies in accordance with Section 508.2.
2. Live/work units complying with the *International Residential Code* shall not be required to comply with requirements of this code, other than requirements in Section 508.5.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

G126-21 Part I

G126-21 Part II

PART II – IBC[F] 508.5.7

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Building Code

Revise as follows:

[F] 508.5.7 Fire protection. ~~The~~
~~*live*~~ *Live/work* ~~*unit*~~ *units* constructed in accordance with this code shall ~~comply with be provided with a monitored *fire alarm* system where required by Section 907.2.9 and~~ be provided with all of the following:

1. An *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 ~~903.2.8~~.
2. *Smoke alarms* in accordance with Section 907.2.11.
3. Where required by Section 907.2.9.1, a manual *fire alarm system.*

Live/work units constructed in accordance with the *International Residential Code* shall be provided with an *automatic sprinkler system* and *smoke alarms*. The *automatic sprinkler system* shall comply with *International Residential Code* Section P2904, and *smoke alarms* shall comply with *International Residential Code* Section 314.

Staff Note: G125-21 and G126-21addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Currently, some live/work units are permitted to be constructed under the IRC, per the IRC scope, but the IRC scope references back to IBC Section 508.5 for additional specific requirements. So presumably, IRC live/work units are constructed to the IRC, except as modified by IBC Section 508.5. On the other hand, IBC live/work units are constructed to the IBC, including Section 508.5. This proposal more clearly states that approach.
In addition, the fire protection requirements have been edited to clarify the allowance to use fire protection requirements in the IRC for IRC live/work units. It does not appear that the intent of membership in establishing live/work provisions was requiring IRC live/work units to comply with IBC Group R2 fire protection requirements. Plus, the IBC fire protection requirements have been clarified/improved by directly referencing the two applicable sprinkler standards for Group R2 vs. sending the user to another code section to receive the references, and the requirement for smoke alarms has been added for completeness.

Regarding fire alarms for live/work units under the IBC, there are not and never have been any special live/work requirements. Instead, the requirements are based on the general Group R2 occupancy triggers and exceptions found in Section 907.2.9.1, which often won't require a fire alarm system for live/work units based on the exceptions. The reference to "monitored" systems has been dropped, as monitoring requirements will be determined by Section 907.

Cost Impact: The code change proposal will decrease the cost of construction
By clearly conveying that IRC live/work units do not have to meet IBC fire protection requirements, the cost of construction for live/work units may be reduced.

G126-21 Part II

G127-21

IBC: 508.5.1

Proponents: Hoyt Jeter, City of Tacoma/ Planning and Development, representing WABO TCD (hjeter@cityoftacoma.org)

2021 International Building Code

Revise as follows:

508.5.1 Limitations. The following shall apply to live/work areas:

1. The *live/work unit* is permitted to be not greater than 3,000 square feet (279 m^2) in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each *live/work unit*.
3. The nonresidential area function shall be limited to the first or main floor only of the *live/work unit*.
4. ~~Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.~~

Reason Statement: 1. Item number 4 is un-enforceable. When permits are issued, how do you limit the number of employees? The other exceptions will meet the intent allowed per the code.
2. The maximum area of the non-residential area is already limited to 1500 square feet, so that the occupant load will be limited by the floor area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just to make the code consistent for un-enforceable language

G127-21

G128-21

IBC:TABLE 509.1

Proponents: John Williams, Chair, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

SECTION 509 INCIDENTAL USES.

509.1 General. Incidental uses located within single occupancy or mixed occupancy buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses specified in Table 509.1.

Exception: Incidental uses within and serving a *dwelling unit* are not required to comply with this section.

Revise as follows:

TABLE 509.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour and provide automatic sprinkler system
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour and provide automatic sprinkler system
In Group I-2, physical plant maintenance shops	1 hour and provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of ~~10~~ 8.67 cubic feet or greater	1 hour and provide automatic sprinkler system
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than ~~100~~ 50 square feet	1 hour and provide automatic sprinkler system
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

Reason Statement: The change to the waste and linen collection items is correlation with the allowances in the federal requirements (K321). The addition of "and provide and automatic sprinkler system" is editorial since Group I is already required to be sprinklered.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This a federal certification requirement for Group I-2.

G128-21

G129-21

IBC: 302.3(New), SECTION 509, 509.1, 509.2, 509.3, 509.4, 509.4.1, 509.4.1.1, 509.4.2, 509.4.2.1

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

2021 International Building Code

Add new text as follows:

302.3 Incidental Uses. Incidental uses shall comply with Section 429.

Revise as follows:

SECTION ~~509~~ 429 INCIDENTAL USES.

~~509.1~~ 429.1 General. Incidental uses located within single occupancy or mixed occupancy buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses specified in Table ~~509.1~~ 429.1.

Exception: Incidental uses within and serving a *dwelling unit* are not required to comply with this section.

TABLE ~~509.1~~ 429.1
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In *ambulatory care facilities*, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

~~509.2~~ 429.2 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1. Incidental uses shall be included in the building occupancies within which they are located.

~~509.3~~ 429.3 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* of the *story* in which they are located.

~~509.4~~ 429.4 Separation and protection. The incidental uses specified in Table ~~509.1~~ 429.1 shall be separated from the remainder of the building or equipped with an *automatic sprinkler system*, or both, in accordance with the provisions of that table.

~~509.4.1~~ 429.4.1 Separation. Where Table ~~509.1~~ 429.1 specifies a fire-resistance-rated separation, the incidental uses shall be separated from the remainder of the *building* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both. Construction supporting 1-hour *fire barriers* or *horizontal assemblies* used for incidental use separations in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

~~509.4.1.1~~ 429.4.1.1 Type IV-B and IV-C construction. Where Table ~~509.1~~ 429.1 specifies a fire-resistance-rated separation, *mass timber* elements serving as *fire barriers* or *horizontal assemblies* in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^1/_2$ inch (12.7 mm) in thickness or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

~~509.4.2~~ 429.4.2 Protection. Where Table ~~509.1~~ 429.1 permits an *automatic sprinkler system* without a *fire barrier*, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor assembly or roof assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.2.6.6. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental use shall not have air transfer openings unless provided with *smoke dampers* in accordance with Section 710.8.

~~509.4.2.1~~ 429.4.2.1 Protection limitation. Where an *automatic sprinkler system* is provided in accordance with Table ~~509.1~~ 429.1, only the space occupied by the incidental use need be equipped with such a system.

Reason Statement: When users of the code are looking for specific requirements, they intuitively look to the chapter where the nature of the provision they are looking for is most closely related. This is why moving Section 509 to Chapter 4 will lead to better understanding and application of the code. The provisions of Chapter 5 “control the height and area of structures” whereas Chapter 4 contains “special uses”. "Incidental Uses” are ancillary functions associated with a greater level of risk to that occupancy. Therefore Section 509 belongs in Chapter 4.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a relocation of existing provisions only with no changes.

G129-21

G130-21

IBC: 510.2, 707.3.11 (New)

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

2021 International Building Code

Revise as follows:

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

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

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

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

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

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

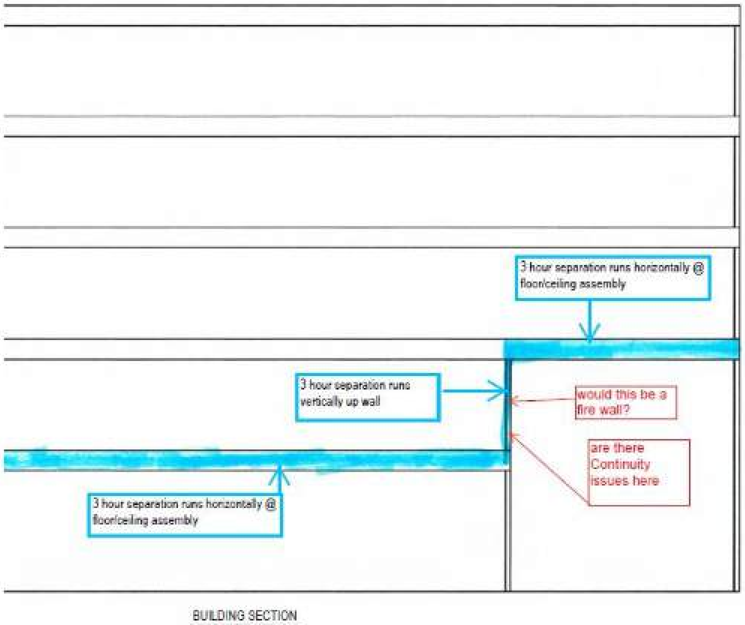
   4.2. The *stairway*located in the Type IA building is enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

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

Add new text as follows:

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

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



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

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

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

G130-21

G131-21

IBC: 510.2

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

2021 International Building Code

Revise as follows:

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

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where vertical offsets are provided as part of a *horizontal assembly*, the vertical offset and the structure supporting the vertical offset shall have a *fire-resistance rating* of not less than 3 hours.
2. The building below, including the *horizontal assembly*, <u>complies with one of the following:</u>

   2.1. <u>The building below, including the *horizontal assembly,*</u> is of Type IA construction.

   2.2. <u>The building below, including the *horizontal assembly* is of Type IVA construction, with *noncombustible protection* contributing the time required by Section 602.4.1.2.1 for interior protection of mass timber, but not less than 180 minutes.</u>

3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.

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

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

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

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

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

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

Reason Statement: Podium type buildings of 3-hour noncombustible Type IA construction are a popular method of construction to support one or more residential buildings on top of the 3-hour noncombustible podium structure. This method of construction is important as it provides a considerable amount of low-cost housing in urban cities. With the advent of Type IVA construction in the 2021 IBC there is now a combustible type of construction that provides fire performance equal to or greater to Type IA from a fire resistance and content burnout standpoint. According to 2021 IBC Section 722.7.1 at least 2/3rds of the fire resistance rating in Type IVA mass timber construction must come from noncombustible protection applied on the interior of the structure. Assuming the sprinkler system fails to control a content fire, and with most fuel load and ventilation scenarios, the content burns out long before the mass timber building contributes significant fuel to the fire. Having 2/3 of the fire resistance provided by noncombustible protection was demonstrated effective to allow burn out for typical residential fire loads during tests performed at the ATF labs by the ICC Ad Hoc Committee on Tall Wood Buildings.

Since a podium type structure supporting other structures adds complexity to fire-fighting rescue and suppression operations and also may have occupancy groups with fuel loads greater than the tested residential fuel loads, by providing 100% contribution of the minimum required fire resistance rating on the interior of a type IVA podium from noncombustible protection, it is clear the 3 hour podium proposed by this code change will perform better than what is currently provided in Section 510.2 with 3 hour Type IA noncombustible construction.

The actual fire resistance rating of the podium will be greater than 3 hours because the total fire resistance rating of mass timber is equal to the sum of the contribution from noncombustible protection added to the contribution from the mass timber. It is also clear the mass timber building structure would not become a significant factor contributing to the fuel load until after a code allowed 3 hour Type IVA podium would theoretically be allowed to fail. Some may say requiring this 3 hour (100%) of required fire resistant rating using noncombustible protection is too conservative in this proposal. This level of performance has been shown to be readily achievable utilizing testing described in 2021 IBC Section 703.6 of noncombustible mineral wool board, gypsum or a combination of the two materials over mass timber.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change creates another option to construct the same building with another material and does not add additional cost.

G131-21

G132-21

IBC: 510.2

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

2021 International Building Code

Revise as follows:

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

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

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

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

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

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

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

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

Reason Statement: The IBC currently limits a building that is over what is commonly referred to as a "podium building" (IBC Section 510.2, Item 5) to having "multiple Group A occupancy uses, each with an occupant load of
less than 300." This means that no single assembly space is allowed to have an occupant load of 300 persons within a building located above the horizontal assembly - think museum, swimming pool deck or movie theater. or a health club. Again, I want you remember that this is a limit to ALL Group A occupancies, not just large entertainment venues - think outdoor sculpture museums (Group A-3). And in this day of COVID-19, think outdoor restaurants (Group A-2) or even outdoor places of religious worship (Group A-5). The current language in the code would not allow these to occur over a podium building. This limitation really curtails the construction of buildings that are placed on a podium building on an inner city site.

And what just does "shall be permitted to have multiple Group A occupancy uses, each with an occupant load of 300" mean? Does each Group A space with 299 occupants have to be separated from an adjacent Group A space with 299 occupants? And if so, does the separation need to be fire rated? But what if each of these spaces with 299 persons discharge out into a foyer (that has an occupant load of 299) and which leads to the exterior? Is that acceptable? But then everyone is discharged out onto the horizontal assembly to open air - just like a Group A-5 occupancy - but oops, a Group A-5 occupancy cannot have more than 300 persons to be located above the horizontal assembly.

This proposal seeks to eliminate the Group A 299 occupant load limitation in its entirety and let the overall provisions found in the IBC dictate the design of the Group A building or building with a Group A occupancy constructed over the horizontal assembly.

While this limitation, and all what is currently in IBC 510 has been in the IBC since the 2000 IBC, the real roots of the entire section are in one of the

legacy codes - the Uniform Building Code (UBC) Section 311.2.2.1
"311.2.2.1 Group S, Division 3 with Group A, Division 3; Group B; Group M or R, Division 1 Occupancy above.

Other provisions of this code notwithstanding, a basement or first story of a building may be considered as a separate and distinct building for the purpose of area limitations, limitation of number of stories and type of construction, when all of the following conditions are met:"

And specifically Item 2 in UBC Section 311.2.2.1:
"2. The building above the three-hour occupancy separation contains only Group A, Division 3; Group B; or Group M or R, Division 1 Occupancies."

In the 1997 UBC Group A was divided into 5 sub classifications:

- Division 1 - Any assembly building or portion of a building with a legitimate stage and an occupant load of 1,000 or more
- Division 2 - Any assembly building or portion of a building with an occupant load of less than 1,000 and a legitimate stage.
- Division 2.1 - Any assembly building or portion of a building with an occupant load of 300 or more without a legitimate stage, including such buildings used for educational purposes and not classified as a Group E or Group B, Division 2 Occupancy.
- Division 3 - Any assembly building or portion of a building with an occupant load of less than 300 without a legitimate stage, including such buildings used for educational purposes and not classified as a Group E or Group B, Division 2 Occupancies
- Division 4 - Stadiums, reviewing stands and amusement park structures not included within other Group A occupancies.

The thing is, the UBC occupancy classifications do correlate in any way to the Group A occupancy classifications in 2021 IBC nor in how the provisions are applied. When the applicable provisions of the IBC are applied to a building with an assembly space having an occupant load of 300 or more, it is unjustified and inconsistent to prohibit that space from being located on top of podium building.

Cost Impact: The code change proposal will decrease the cost of construction
If accepted this code change will reduce the cost of construction as buildings above a podium building will have a broader choice of types of construction.

G132-21

G133-21

IBC: 510.4

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

2021 International Building Code

Revise as follows:

510.4 Transition story ~~Parking~~ beneath Group R. Where a transition story, with a maximum height of one *story* ~~*above grade plane* Group S-2 parking garage, enclosed or open, or combination thereof,~~ of Type I construction or ~~open~~ of Type IV construction, ~~with grade entrance,~~ is provided under a building of Group R, the number of *stories* to be used in determining the minimum type of construction shall be measured from the floor above such a transition story ~~parking area~~. The floor assembly between the transition story ~~parking garage~~ and the Group R above shall comply with the type of construction required for the ~~parking garage~~ occupancy of the transition story and shall also provide a *fire-resistance rating* not less than the mixed occupancy separation required in Section 508.4 and the unit separation required in Section 420.

The transition story building elements shall have minimum fire resistance ratings as required in Table 601 for the transition story type of construction. Where located at grade, load bearing transition story building elements shall have a fire resistance rating of not less than 1-hour. Where the transition story is located above grade on top of a horizontal building separation in accordance with Section 510.2, load bearing transition story building elements shall have a fire resistance rating of not less than 2-hours and each required exit from the Group R occupancy building above shall be located in portions of the building above separated by one or more fire barriers with a fire-resistance rating of not less than 2 hours.

Reason Statement: This proposal (as with the prior language) does not increase the height or allowable area for a residential building of the same type of construction. It allows another story within the existing height limits as did the prior Section 510.4 code language. The difference is this proposal does not restrict the concept to only buildings with parking at grade. Other podium type provisions have evolved in the code however this section remains in the same form as when originally published in the 2000 IBC. Because most zoning provisions encourage occupancy groups associated with pedestrian traffic at the ground floor, this provision is rarely used in new buildings and is in need of an update. At the same time residential buildings located over 3 hour type IA podiums have evolved significantly allowing different uses in the podium and multiple stories within the same type IA structure. In order to more efficiently utilize a site of fixed area, the designer may add mezzanines into a Type IIIA residential building located over a 3 hour Type IA podium or may increase the number of stories in the Type IA podium.

An innovative approach to safely and economically maximize the build out of these residential buildings over 3 hour podiums was created in the Seattle area after a group of interested parties, code officials, architects and housing proponents met to brainstorm how to safely build up to 8 stories utilizing 6 stories of Type IIIA light frame construction over two stories of Type IA (6 over 2). See the following link: City Council Allows Taller Wood Buildings, Reforms Street Vacation Process and Advances Waterfront LID | The Urbanist
The language in this code change proposal is slightly more conservative than the City of Seattle version in that the transition floor would need to be 2 hour Type IV construction when located over a podium permitted in Section 510.2 rather than two hour light frame construction. The language in the code change proposal would also allow the same one hour heavy timber in 510.4 for the transitions story when built at grade but would be more flexible allowing other occupancy groups at the first floor.

This proposal does not increase the height or area but does allow an additional story in the same height.

An additional requirement of the Seattle ordinance and other local adoptions is to require exits enclosures above a podium in this configuration to be segregated in different parts of the structure by a two hour fire barrier and the stairways to have pressurization. The segregation is included in this proposal but since a building of this height (85 feet) with the potential for a floor above 75 feet could possibly become a highrise and would already be subject to stair pressurization, that requirement of the Seattle area ordinances was left off. See attached link for the Seattle ordinance: Legislation Text - CB 119248 (legistar.com)

Cost Impact: The code change proposal will decrease the cost of construction
This code change would decrease the cost of construction for a 6 over 2 building from that of a 5 over 3 building of the same height and area. This proposal does not increase or decrease the cost for other building configurations because it allows what was previously allowed by this code section.

G133-21

G134-21

IBC: TABLE 601

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

2021 International Building Code

Revise as follows:

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**C**	**HT**	**A**	**B**
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	**3**	2	2	1/HT[g]	1	0
Nonbearing walls and 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)~~ Roofs other than occupiable roofs	$1^1/_2$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	$1^1/_2$	1	1	HT	1[b,c]	0
Occupiable Roofs	2	2	1[c]	0[c]	1[c]	0	2	2	2	HT	1[c]	0

For SI: 1 foot = 304.8 mm.

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

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

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

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

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

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

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

Reason Statement: Roofs of buildings or portions thereof designed as occupiable roofs have occupant loads consistent with an occupiable space use, where a significant number of people can access the roof. As such, the risk of a fire occurring on the story below and compromising the roof structure is much more serious than the normal condition where the roof is just resisting the weight of the roof assembly including: insulation, ductwork, piping, roof coverings, rooftop equipment, environmental loads, and the weight of maintenance personnel.
The use of occupiable roofs has expanded in recent times without adequate consideration for the fire protection of these spaces. The consequences of structural failure of occupiable roofs are no less dire than those associated with floors, as such the values for occupiable roofs mirror those for floors. In addition to supporting much higher occupant loads, occupiable roofs frequently support heavy items not seen on other roofs such as raised decks, pools, hot tubs, built-in furnishings, and barbeques. To address this potential life safety issue, it is proposed to split the fire ratings for roof construction and associated secondary members into two rows, one for occupiable roofs and one for all other roofs. The fire ratings for roof construction supporting an occupied roof are made the same as those for floor construction. Consistent with that mirroring, footnotes “a” and “b” are not applied to any of the ratings specified for an occupiable roof.

Altering the occupancy classification of an existing building’s roof to an occupiable roof is a major reuse of space, and as such, coordination with the IEBC should occur.

This proposal is intended to protect the structure supporting the occupiable roof during a fire event.

Cost Impact: The code change proposal will increase the cost of construction
The code change will increase the cost of construction for buildings with an occupiable roof. Additionally, it will increase the cost of construction for roofs over a tall story that previously would have been allowed to have less-protected or unprotected roof construction.

G135-21

IBC: TABLE 601

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

2021 International Building Code

Revise as follows:

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[~~f~~ g] (see Section 202)	3[a, ~~b~~ c]	2[a, ~~b,~~ c, d]	1[~~b,~~ c, d]	0[~~c~~ 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 partitionsExterior	See Table 705.5											
Nonbearing walls and partitionsInterior[~~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 1/2[b, c]	1[b,c, d]	1[b,c, d]	0[~~c~~ 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 assembly shall be equal to or greater than the floor below.

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

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

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

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

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

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

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

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

G135-21

G136-21

IBC: TABLE 601

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

2021 International Building Code

Revise as follows:

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

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

For SI: 1 foot = 304.8 mm.

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

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

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

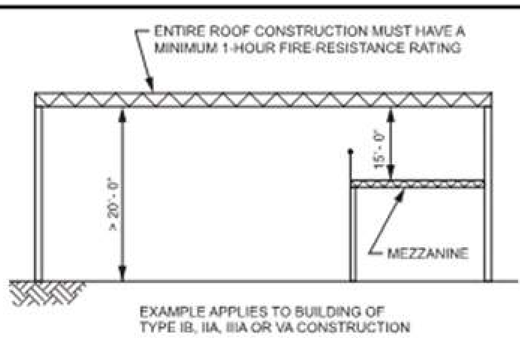
d. Not less than the fire-resistance rating required by other sections of this code.

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

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

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

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



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Figure 601(2)
PROTECTION OF ROOF CONSTRUCTION

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

G136-21

G137-21

IBC: TABLE 601

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

2021 International Building Code

Revise as follows:

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

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

For SI: 1 foot = 304.8 mm.

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

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

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

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

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

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

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

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

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

G137-21

G138-21

IBC: TABLE 601

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

2021 International Building Code

Revise as follows:

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

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

For SI: 1 foot = 304.8 mm.

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

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

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

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

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

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

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

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

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

G138-21

G139-21

IBC: TABLE 601

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2021 International Building Code

Revise as follows:

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

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

For SI: 1 foot = 304.8 mm.

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

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

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

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

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

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

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

h. In high-rise buildings, the fire-resistance rating shall be permitted to be reduced in accordance with Section 403.

Reason Statement: This is only an editorial modification making a cross reference from the Table to Section 403 of the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is not changing any code requirements. It is only making a cross reference from the Table to Section 403.

G139-21

G140-21

IBC: 602.1

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

2021 International Building Code

Revise as follows:

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five *construction types* defined in Sections 602.2 through 602.5 <u>and one subclassification of that *construction type* that determines the minimum *fire-resistance rating* of its *building elements*</u>. The *building elements* shall have a *fire-resistance rating* not less than that specified in Table 601 and *exterior walls* shall have a *fire-resistance rating* not less than that specified in Table 705.5. Where required to have a *fire-resistance rating* by Table 601, *building elements*shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in *building elements* shall not be required unless required by other provisions of this code.

Reason Statement: This proposal is intended to clarify that buildings not only need to be classified into one of five construction types of either: I, II, III, IV, or V, but also that they must be assigned a subclassification that describes the degree of fire resistance required for its building elements. Examples of this combined construction type with its subclassification are: 1A, IIIB, IVC, VA, etc.
We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

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

G140-21

G141-21

IBC: 602.1.2 (New)

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

2021 International Building Code

Add new text as follows:

602.1.2 Horizontal Assemblies. Where Table 601 requires floor construction to have a *fire-resistance rating*, the floors that separate *stories* shall be *horizontal assemblies* in accordance with Section 711.

Reason Statement: This proposal is intended to clarify what is already the intent of the code with respect to separating different stories from each other to resist the spread of fire. Section 711.2.4 makes clear that when a horizontal assembly exists, it shall have the fire-resistance rating in accordance with the type of construction. Section 704.4.2 provides horizontal assemblies as an option versus individual encasement of secondary structural members.
The problem that this proposal is intending to address, is that no code section actually requires the creation of the horizontal assembly when a floor separating stories is required to be fire-resistance rated, but that is the intent of the code.

We should be as unambiguous as possible with code language, so long as the intent is not compromised, and this proposal seeks to do that.

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

G141-21

G142-21

IBC: 602.3, 602.3.1 (New), 602.3.2 (New)

Proponents: Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the *exterior walls* are of noncombustible materials and the interior *building elements* are of any material permitted by this code. ~~*Fire-retardant-treated wood* framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.~~ Exterior walls complying with Section 602.3.1 or 602.3.2 shall be permitted.

Add new text as follows:

602.3.1 Fire-retardant-treated wood in exterior walls. *Fire-retardant-treated wood framing* and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour fire-resistance rating or less.

602.3.2 Cross-laminated timber in exterior walls. Cross-laminated timber (CLT) not less than 4 inches (102 mm) in thickness complying with Section 2303.1.4 and appurtenant heavy timber structural members shall be permitted within exterior wall assemblies with a 2-hour fire-resistance rating or less. The exterior side of the exterior walls shall be protected with noncombustible protection with a minimum assigned time of 40 minutes and shall comply with Section 722.7. Components of the exterior wall covering shall be of noncombustible material except water-resistive barriers complying with Section 1402.5.

Reason Statement: Low-rise and mid-rise buildings are beginning to utilize cross-laminated timber (CLT) and other mass timber products. CLT walls are layers of solid-sawn or structural composite lumber bonded with structural adhesive to form a solid wood wall panel without concealed spaces, typically between 4 and 10.5 inches thick. CLT walls have exceptional fire resistance as demonstrated by the research and testing completed by the ICC Ad Hoc Committee on Tall Wood Buildings when the new mass timber construction types in the 2021 IBC were being considered.
Currently exterior load-bearing walls of Type III construction are required to be of 2-hour fire-resistance rated noncombustible construction, such as light gauge steel framing, or 2-hour fire-resistance rated fire-retardant-treated wood framing and sheathing. This proposal would permit load-bearing two-hour fire-resistance rated and protected mass timber in lieu of fire-retardant-treated wood framing for exterior walls in Type III construction if they are protected with noncombustible materials and comply with other requirements for exterior walls of Type IV-C construction (or the more restrictive requirements for Types IV-B and IV-A construction). For comparison, Type IV-C construction is permitted greater allowable areas than Type III and more stories above grade for many occupancies, including Groups R, S-1, M, B, A-3, and A-2.

Load-bearing exterior mass timber walls of Type IV-C construction are required to be two-hour fire-resistance rated with at least 40 minutes of noncombustible protection on the exterior side. In addition, except for a water-resistive barrier complying with the heat release, flame spread, and smoke-developed index limits of Section 602.4.3.1, combustible exterior wall coverings are prohibited. The combined requirements of a two-hour rating, a minimum noncombustible protection of 40 minutes on the exterior, and the prohibition of combustible materials on the exterior side will provide exterior wall performance that exceeds the existing alternatives for Type III construction.

The form of the proposal mirrors the current requirements in Section 602.4.4.2 for CLT in exterior walls of Type IV-HT construction. However, whereas Type IV-HT exterior walls require the mass timber to be protected on the exterior with 15/32-inch fire-retardant-treated wood, 1/2-inch gypsum board, or simply a noncombustible material of any thickness, under this proposal the two-hour exterior walls in Type III will be required to have at least 40 minutes of noncombustible protection on the exterior, and combustible exterior wall coverings are not permitted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an additional alternative for exterior walls in Type III construction and therefore there is no mandate that will increase the cost of construction.

G142-21

G143-21

IBC: 602.4

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

~~Exception~~ Exceptions:

1. Interior building elements and nonload-bearing walls and partitions of Type IV-HT construction in accordance with Section 602.4.4.
2. Fire-retardant-treated wood complying with Section 2303.2 shall be permitted for use as interior nonload-bearing walls and partitions for Types IV-A, IV-B and IV-C construction.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement:

In Table 601, the hourly fire-resistance ratings for interior nonbearing walls and partitions in Types IV-A, IV-B, and IV-C are the same for the other construction types where fire-retardant-treated wood (FRTW) is permitted (ex. Type IIIA is also 0.)

The difference between FRTW and other materials used in a 0-hour-rated assembly is that through its chemical impregnation, smaller-diameter FRTW behaves like the larger-diameter heavy timber members when exposed to real-world fire conditions. This behavior helps explain why FRTW is already allowed in exterior wall assemblies in Type IV-HT construction and also can be used in lieu of noncombustible materials in certain applications in the code for Types I and II construction.

By allowing this exception, there will be no decrease in the minimum hourly fire-resistance rating by including FRTW for Types IV-A, IV-B, and IV-C construction as interior nonbearing walls and partitions, nor will there be any adverse impact to building or life safety**.**

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

The code as it is written is unchanged and no extra requirements have been added. This just allows for another safe option that may be constructed.

G143-21

G144-21

IBC: 602.4

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

Exception: Interior *building elements* and *nonload-bearing walls* and partitions of Type IV-HT construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement: This change is editorial and does not change the requirements of the section. The ICC Building Code Action Committee asked AWC to consider taking on this code change proposal when it found one of the proposals by the ICC Tall Wood Building Ad Hoc Committee (TWB) included language that was different from that used elsewhere in the code. We reached out to members of the TWB Committee to see if there was a reason why they used “lowest level of fire department access” instead of “lowest level of fire department vehicle access” and it was confirmed that there was no reasoning or intent behind their use of a differing phrase. Accordingly, we are proposing the change to make it consistent with the language found in other areas of the code, including the definition of "HIGH-RISE BUILDING" as follows: **[BG] HIGH-RISE BUILDING**. A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just an editorial clean up to make the language consistent to that found elsewhere in the code.

G144-21

G145-21

IBC: 602.4

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

2021 International Building Code

Revise as follows:

602.4 Type IV. Type IV construction is that type of construction in which the *building elements* are *mass timber* or noncombustible materials and have *fire-resistance ratings* in accordance with Table 601. *Mass timber* elements shall meet the *fire-resistance-rating* requirements of this section based on either the *fire-resistance rating* of the *noncombustible protection*, the *mass timber*, or a combination of both and shall be determined in accordance with Section 703.2. The minimum dimensions and permitted materials for *building elements* shall comply with the provisions of this section and Section 2304.11. *Mass timber* elements of Types IV-A, IV-B and IV-C construction shall be protected with *noncombustible protection* applied directly to the *mass timber* in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the *noncombustible protection* shall be determined in accordance with Section 703.6 and comply with Section 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior *load-bearing walls* and *nonload-bearing walls* shall be *mass timber*construction, or shall be of noncombustible construction.

Exception: Exterior *load-bearing walls* and *nonload-bearing walls* of Type IV-HT Construction in accordance with Section 602.4.4.

The interior *building elements*, including *nonload-bearing walls* and partitions, shall be of *mass timber*construction or of noncombustible construction.

Exception: Interior *building elements* and *nonload-bearing walls* and partitions of Type IV-HT construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

<u>**Exceptions:** Voids created during manufacturing or when solid members are joined together shall not be considered concealed spaces when all of the following criteria are met:</u>

1. <u>Voids created during the manufacturing of mass timber members are no more than 25% of the depth of a solid mass timber member or no more than one lamination thickness whichever is smaller.</u>
2. <u>Voids in a member or assembly shall not form a prohibited structural notch.</u>
3. <u>Voids on the inside of an assembly where two members are joined or built up are no more than 25% of the depth of the overall built up mass timber assembly including the thickness of noncombustible protection.</u>
4. <u>Voids are filled with noncombustible material suitable as a fire block in Section 718.2.1</u>
5. <u>Joined members are sealed as required in Section 703.7.</u>

In buildings of Type IV-A, IV-B, and IV-C construction with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department access, up to and including 12 *stories* or 180 feet (54 864 mm) above *grade plane*, *mass timber* interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 *stories* or 180 feet (54 864 mm) above *grade plane*, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

Reason Statement: When portions or rooms on a story of a mass timber building are premanufactured off site and assembled together on site to form a multi story building, a space can be created for mechanical, electrical and plumbing (MEP) at the interface used to join the upper and lower halves of a floor ceiling assembly or each side of a wall assembly. Mineral wool as allowed as a fire block in 718.2.1 has been tested and shown to be highly effective at, insulation and sound control while protecting mass timber and limiting the spread of fire. This space does not meet the definition of a joint in Section 202 as it is not required for movement or for tolerances.
25% was chosen because it would set limits while allowing a reasonable space for MEP and a requirement is included not to create notches that are prohibited.

When CLT is manufactured, the 25% or one lamination limitation (whichever is less) would prohibit a void of one lamination thickness in three ply CLT (1/3 = .33 which is greater than .25). This limit would allow up to one lamination typical four ply or greater thickness CLT panel.

Additionally when two panels are joined together to create a deeper built up floor ceiling or wall assembly, 25% of the overall section including noncombustible protection thickness would allow a short run of a properly sloped three inch drain that is adequate for DWV of a single unit to be incorporated between built up assemblies. By burying utilities inside of mineral wool, inside of mass timber that is covered with noncombustible protection, the need for a though penetration and the need for a concealed space above the ceiling in the unit below can potentially be eliminated allowing a more robust floor ceiling assembly that contains no through penetrations.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal decreases the cost of construction by allowing the ability to prefabricate stories of Type IV construction or to manufacture conduit within a manufactured panel.

G145-21

G146-21

IBC: 602.4.1.2

Proponents: Susan Jones, representing atelierjones, llc (susan@atelierjones.com); Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov); Carl Baldassarra, Wiss Janney Elstner Associates, representing Self (cbaldassarra@wje.com)

2021 International Building Code

Revise as follows:

602.4.1.2 Interior protection. Interior faces of all*mass timber* elements, including the inside faces of exterior *mass timber* walls and *mass timber* roofs, shall be protected with materials complying with Section 703.3.

> **Exception:** Unprotected portions of mass timber ceilings, including attached beams, shall be permitted where limited to an area less than or equal to 40 percent of the floor area in a dwelling unit or fire area.

Reason Statement: The Ad-Hoc Committee on Tall Wood Buildings (TWB) was created by the Board of Directors of the International Code Council (ICC) to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB created several code change proposals with respect to the concept of tall buildings of mass timber in the last code cycle. All of the TWB proposals were approved. The TWB decided, as it worked its way through data and research, that it would only incorporate criteria into the code that had bases in tests. When the fire test program at ATF was being developed, a determination was made regarding how much ceiling area and how much wall area and in which combinations could be left exposed in those tests. Limitations in the physical equipment (exhaust hood and exhaust duct connector) limited the amount of exposed MT material and led to a conservative calculation estimate which, for ceilings, became 20% of the floor area. Thus, the number that was incorporated into the text of the 2021 IBC reflected those limitations.

The proposed revisions above are based upon recently completed research conducted at the Research Institute of Sweden (RISE). These fire tests demonstrated that the proposed amounts of unprotected areas on the ceiling and walls, as a function of floor area, can be safely implemented while still achieving the performance objectives specified by the ICC Tall Wood Building Ad-Hoc Committee in the development of the tall building mass timber provisions in the 2021 I-codes. Specifically, Test 1 of the test series conducted at RISE involved a ceiling in which 100% of the area was unprotected mass timber. Tests 2 and 5 had unprotected mass timber on 100% of the ceiling area, in addition to unprotected areas on the two opposing side walls, equivalent to 78% of the floor area. These tests exhibited satisfactory performance in that no significant fire re-growth was observed and temperatures within the compartment decreased continuously from the time of the fully-developed phase until the end of the four-hour test. The proposed allowable unprotected area on the ceiling is a conservative application of the configurations tested in all of RISE tests. Although the RISE data also justifies a percentage of unprotected area of the wall, this proposal leaves the walls protected for the sake of conservatism. Videos of the tests performed at RISE may be viewed at the following link:

https://www.ri.se/en/what-we-do/expertises/fire-safety-timber-buildings

Furthermore, all of the code proposals included in the work of the TWB were based on CLT products using an earlier edition of material standard PRG 320. During that code development process, being responsive to the concerns of the TWB, the industry demonstrated that the latest PRG-320 standard required a higher grade of adhesive to limit delamination during fire exposure. These RISE fire tests used the subsequent improvements in the code-referenced product standard for CLT (ANSI/APA PRG-320), resulting in enhancements to fire safety.

Cost Impact: The code change proposal will decrease the cost of construction
The proposed changes will decrease the cost of construction, by reducing the required amount of noncombustible protection on ceilings in Type IV-A Construction.

G146-21

G147-21

IBC: 602.4.2.2.2, 602.4.2.2.4

Proponents: Susan Jones, atelierjones, llc, representing atelierjones, llc (susan@atelierjones.com); Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov); Carl Baldassarra, Wiss Janney Elstner Associates, representing Self (cbaldassarra@wje.com)

2021 International Building Code

602.4.2.2 Interior protection. Interior faces of all *mass timber* elements, including the inside face of exterior *mass timber* walls and *mass timber* roofs, shall be protected, as required by this section, with materials complying with Section 703.3.

602.4.2.2.1 Protection time. *Noncombustible protection* shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions specified in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

Revise as follows:

602.4.2.2.2 Protected area. Interior faces of *mass timber* elements, including the inside face of exterior *mass timber walls* and *mass timber roofs*, shall be protected in accordance with Section 602.4.2.2.1.

Exceptions: Unprotected portions of *mass timber*ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings and walls complying with one of the following:
   1.1. Unprotected portions of *mass timber* ceilings, including attached beams, shall be permitted and shall be limited to an area <u>less than or</u> equal to ~~20~~ <u>100</u> percent of the floor area in any *dwelling unit* or *fire area.*
   1.2. Unprotected portions of *mass timber* walls, including attached columns, shall be permitted and shall be limited to an area <u>less than or</u> equal to 40 percent of the floor area in any *dwelling unit* or *fire area.*
   1.3. Unprotected portions of both walls and ceilings of *mass timber*, including attached columns and beams, in any *dwelling unit* or *fire area* shall be permitted in accordance with Section 602.4.2.2.3.
2. *Mass timber* columns and beams that are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

602.4.2.2.3 Mixed unprotected areas. In each *dwelling unit* or *fire area* , where both portions of ceilings and portions of walls are unprotected, the total allowable unprotected area shall be determined in accordance with Equation 6-1.

$$(U_{tc}/U_{ac}) + (U_{tw}/U_{aw}) \leq 1 \qquad \textbf{Equation 6-1}$$

where:

U_{tc} = Total unprotected *mass timber* ceiling areas.

U_{ac} = Allowable unprotected *mass timber* ceiling area conforming to Exception 1.1 of Section 602.4.2.2.2.

U_{tw} = Total unprotected *mass timber* wall areas.

U_{aw} = Allowable unprotected *mass timber* wall area conforming to Exception 1.2 of Section 602.4.2.2.2.

Revise as follows:

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each *dwelling unit* or *fire area*, unprotected portions of *mass timber* walls ~~and ceilings~~ shall be not less than 15 feet (4572 mm) from unprotected portions of other walls ~~and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls~~ measured horizontally along the floor.

Reason Statement: The Ad-Hoc Committee on Tall Wood Buildings (TWB) was created by the Board of Directors of the International Code Council (ICC) to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB created several code change proposals with respect to the concept of tall buildings of mass timber in the last code cycle. All of the TWB proposals were approved. The TWB decided, as it worked its way through data and research, that it would only incorporate criteria into the code that had bases in tests. When the fire test program at ATF was being developed, a determination was made regarding how much ceiling area and how much wall area and in which combinations could be left exposed in those tests. Limitations in the physical equipment (exhaust hood and exhaust duct connector) limited the amount of exposed MT material and led to a conservative calculation estimate which, for ceilings, became 20% of the floor area. Thus, the number that was incorporated into the text of the 2021 IBC reflected those limitations.

The proposed revisions above are based upon recently completed research conducted at the Research Institute of Sweden (RISE). These fire tests demonstrated that the proposed amounts of unprotected areas on the ceiling and walls, as a function of floor area, can be safely implemented while still achieving the performance objectives specified by the ICC Tall Wood Building Ad-Hoc Committee in the development of the tall building mass timber provisions in the 2021 I-codes. Specifically, Test 1 of the test series conducted at RISE involved a ceiling in which 100% of the area was unprotected mass timber. Tests 2 and 5 had unprotected mass timber on 100% of the ceiling area, in addition to unprotected areas on the two opposing side walls, equivalent to 78% of the floor area. These tests exhibited satisfactory performance in that no significant fire re-growth was observed and temperatures within the compartment decreased continuously from the time of the fully-developed phase until the end of the four-hour test.

The proposed increase of allowable unprotected area on the ceiling from 20% to 100% is consistent with the configurations tested in all of the RISE tests. Although the RISE data also justifies a higher percentage of unprotected area of the wall, this proposal leaves the limit at 40% of the floor area for the sake of conservatism. Videos of the tests performed at RISE may be viewed at the following link: https://www.ri.se/en/what-we-do/expertises/fire-safety-timber-buildings

Furthermore, all of the code proposals included in the work of the TWB were based on CLT products using an earlier edition of material standard PRG 320. During that code development process, being responsive to the concerns of the TWB, the industry demonstrated that the latest PRG-320 standard required a higher grade of adhesive to limit delamination during fire exposure. These RISE fire tests used the subsequent improvements in the code-referenced product standard for CLT (ANSI/APA PRG-320), resulting in enhancements to fire safety.

Cost Impact: The code change proposal will decrease the cost of construction
The prosed changes will decrease the cost of construction, by reducing the required amount of noncombustible protection on walls and ceilings in Type IV-B Construction.

G147-21

G148-21

IBC: 602.4.2.2.2

Proponents: Ali Fattah, City of San Diego Development Services Department, representing City of San Diego Development Services Department (afattah@sandiego.gov)

2021 International Building Code

Revise as follows:

602.4.2.2.2 Protected area. Interior faces of *mass timber* elements, including the inside face of exterior *mass timber walls* and *mass timber roofs*, shall be protected in accordance with Section 602.4.2.2.1.

Exceptions: Unprotected portions of *mass timber* ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings and walls complying with one of the following:
   1.1. Unprotected portions of *mass timber* ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20 percent of the floor area in any *dwelling unit* within a story or *fire area* within a story.
   1.2. Unprotected portions of *mass timber* walls, including attached columns, shall be permitted and shall be limited to an area equal to 40 percent of the floor area in any *dwelling unit* within a story or fire area within a story.
   1.3. Unprotected portions of both walls and ceilings of *mass timber*, including attached columns and beams, in any *dwelling unit* or *fire area* shall be permitted in accordance with Section 602.4.2.2.3.
2. *Mass timber* columns and beams that are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

Reason Statement: The proposed code change is based on a public comment that was withdrawn from consideration for code change G108-18 at the Group A PCH, which was the main code change. The public comment was withdrawn and not considered at the request of supporters of Tall wood who at the time argued that a legitimate public comment added with the hundreds of of opposition public comments would put the tall wood proposal in jeopardy due to the online governmental voting process.
Fire area is defined by the designer of the building and is used to limit the scope of application of fire sprinklers and/or fire alarm. As published in the the 2021 IBC, the Section proposed to be revised will allow multiple stories in Type IV B construction with exposed ceilings and walls in a multi-level units and in non-residential buildings like an office building.

- This condition was not tested during the code development process for Tall Wood package; it was also not discussed during the lengthy heated debate on the complex tall wood package.
- A single story dwelling unit or multi-story dwelling unit within a tall wood building constructed of Type IV B construction will be separated from adjacent dwelling units with fire resistive construction, as low as 1/2 hour and a non-residential tenant spaces may not be separated from adjoining tenant spaces.

Additionally, Section 602.4.2.2.4 requires that exposed portions of walls and ceilings be separated form one another by 15 feet, however the Section seems to apply within the story. The intent of the protection discussed in Section 602.4.2.2.2 is to limit the amount of exposed wood in walls and ceilings even if their thickness provides for the required fire resistance rating. A concern has been that the exposed wood can contribute to the fire load and full scale testing performed to technically substantiate the requirements in Section 602.4.2.2.2 did not envision open multiple stories and the full scale test set up included protected shafts between stories.

After speaking with some of original proponents for the exceptions to Section 602.4.2.2.2, it was clear that the Tall Wood committee struggled to find a simple useable method to address a desire by the architectural community to allow for the warmth and beauty of wood to be exposed and appreciated by occupants.

Fire area is defined as "[BF] FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above."

- Fire area is bounded by horizontal assemblies and fire barriers, however not all horizontal assemblies are required to be continuous to exterior walls.
- Not all vertical openings between stories that pass through horizontal assemblies need to be protected. Section 712 of the IBC permits openings between stories that are not protected with fire barriers and Section 712.1.12 permits many interconnected stories. Section 712 includes numerous subsections that permit the omission of shaft protection for vertical openings.
- Yes fire area was an elegant solution but perhaps the limitation should have been within dwelling units and separated tenant spaces.

We request that the General Committee approve this reasonable update to the exception to limit applicability of the exception within a story for both dwelling units and fire areas.

2018 IBC Commentary Fire Area

[BF] FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

This term is used to describe a specific and controlled area within a building that may **consist of a portion of the floor area within a single story, one entire story or the combined floor area of several stories, depending on how these areas are enclosed and separated from other floor areas**. Where a fire barrier with a fire-resistance rating in accordance with Section 707.3.10 divides the floor area of a one-story building, the floor area on each side of the wall would constitute a separate fire area. Where a horizontal assembly separating the two stories in a two-story building is fire-resistance rated in accordance with Section 711.2.4, each story would be a separate fire area. In cases where mezzanines are present, the floor area of the mezzanine is included in the fire area calculations, even though the area of the mezzanine does not contribute to the building area calculations. See the commentary to Sections 707.3.10 and 711.2.4 for further information.

Note that fire walls are one way of creating fire areas but are typically used to create separate buildings.

Cost Impact: The code change proposal will increase the cost of construction
The proposed code change may increase the cost of construction in that more gypsum board we be required. However this building system is so new there is not much history of applications for precision in this determination.

G148-21

G149-21

IBC: 602.4.2.3

Proponents: Jonathan Siu, Self, representing Washington Association of Building Officials Technical Code Development Committee; Micah Chappell, Seattle Department of Construction and Inspections, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

602.4.2.3 Floors. The floor assembly shall contain a noncombustible material not less than 1 inch (25 mm) in thickness above the*mass timber*. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. <u>Except where unprotected mass timber ceilings are permitted in Section 602.4.2.2.2,</u> ~~The~~ <u>the</u> underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

Reason Statement: This code change proposal is intended to address an apparent conflict in the code.

For Type IV-B construction, the current code requires the underside of mass timber floor assemblies to be protected in accordance with the provisions for Type IV-A construction (the last sentence in Section 602.4.2.3 points to Section 602.4.1.2). However, Section 602.4.1.2 does not permit any exposed mass timber ("…interior faces of **all** mass timber elements…shall be protected…." [emphasis mine]). This conflicts with Section 602.4.2.2.2, which allows some limited exposed mass timber.

This proposal eliminates the conflict by clarifying the reference to Type IV-A construction does not apply to the unprotected portions of mass timber permitted for Type IV-B construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this is a resolution of an apparent conflict in the code, there is no increase or decrease in the cost of construction.

G149-21

G150-21

IBC: 602.4.4.3

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4.4.3 Concealed spaces. Concealed spaces shall not contain combustible materials other than *building elements* and electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the *International Mechanical Code*. Concealed spaces shall comply with applicable provisions of Section 718. Concealed spaces shall be protected in accordance with one or more of the following:

1. The building shall be sprinklered throughout in accordance with Section 903.3.1.1 and automatic sprinklers shall also be provided in the concealed space.
2. The concealed space shall be completely filled with noncombustible insulation.
3. Combustible surfaces within the concealed space shall be fully sheathed with not less than $^5/_8$-inch Type X *gypsum board.*

Exception: Concealed spaces within interior walls and partitions with a 1-hour or greater *fire-resistance rating* complying with Section 2304.11.2.2 shall not require additional protection.

Reason Statement: The change is necessary to adequately convey the intent of the third protection alternative. Only combustible surfaces in concealed spaces need to be protected. If a concealed space is created by furring out with steel studs, for instance, only the heavy timber surfaces would need to be sheathed with 5/8 inch Type X gypsum board, not the steel studs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We feel this change is essentially editorial in nature in that it is only clarifying the text to match the original intent of the 3rd option.

G150-21

G151-21

IBC: 602.4.4.4

Proponents: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org)

2021 International Building Code

Revise as follows:

602.4.4.4 Exterior structural members. Where a ~~horizontal~~ *fire separation distance* of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

Reason Statement: Although it has been correctly explained in the IBC Commentary for many editions, code officials sometimes question the intent of this section, and wonder if the exterior columns themselves must be separated from one another. Using the defined term "fire separation distance" will eliminate any confusion as to how that distance is to be measured. This change is editorial and does not change the requirement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
We feel that this proposed change only reflects the intent of the code.

G151-21

G152-21

IBC: SECTION 603, 603.1

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

SECTION 603 COMBUSTIBLE MATERIAL IN NON-COMBUSTIBLE CONSTRUCTION.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction, and in buildings of Type III or IV construction where non-combustible materials are required, in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

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

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

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

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

   Exceptions:

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

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

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

   Exceptions:

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

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.

14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: Types III and IV are required to have non-combustible wall assemblies, yet the applicable combustible material exceptions of 603 have no direct path of allowance within these assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Formatting and wording error correction, the industry already assumes this section and its contents apply to the construction types in question.

G152-21

G153-21

IBC: 603.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

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

1. *Fire-retardant-treated wood* complying with Section 2303.2 shall be permitted in:
   - 1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities.*
   - 1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
   - 1.3. Roof construction, including girders, trusses, framing and decking.

     Exceptions:

     1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).
     2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A *roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.
   - 1.4. Balconies, porches, decks and exterior *stairways* not used as required exits on buildings three *stories* or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood complying with Section 2303.2, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.

16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: To establish consistency within the code. Throughout the section, language appears as both, “complying with 2303.2” and without it. I am adding the, “complying with 2303.2” to the sections where it has been left off.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is a clerical addition to the code. The phrase appears in some sections but not others.

G153-21

G154-21

IBC: 603.1

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

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

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

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

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

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

   Exceptions:

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

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

   1.5. <u>Floors, including trusses, framing and decking, of Type IIB construction where fire-resistance-rated construction is not required.</u>

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

   Exceptions:

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

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.

15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: In Table 601, Type IIB floors have a “0” fire resistance rating. Fire-retardant-treated wood is allowed in Section 603 in several areas. The height limitations for many sprinklered occupancy groups for Type IIB are the same as IIIB, where untreated wood floors are allowed. Many floor decks are designed for diaphragm action, and fire-retardant-treated plywood is often used in this application but requires approval as an alternate by the AHJ. This code provision will provide design professionals with an additional option. Fire-retardant-treated wood floor trusses or framing should also be allowed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code proposal allows for another method to construct within Type II. All current methods are unchanged.

G154-21

G155-21

IBC: 603.1

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com); James Gogolski, representing Hoover Treated Wood Products (jgogolski@frtw.com)

2021 International Building Code

Revise as follows:

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

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

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

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

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

   Exceptions:

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

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

   1.5. <u>Mezzanine floor construction and associated secondary members where the fire-resistance-rated floor assembly has the fire resistance of that required by the type of construction and is solidly filled with insulation or is constructed with fireblocking of fire-retardant-treated wood.</u>

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

   Exceptions:

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

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.

13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.

Reason Statement: Many mezzanine floors are designed to carry heavy loads and as diaphragms to resist lateral forces. Plywood is ideally suited for these applications, and designers frequently want to use plywood in their mezzanine floor designs. Currently, in Types I and II construction, design professionals must seek approval from the AHJ through Section 104.11 and the alternative materials process.
Mezzanine floors do not contribute to either the building area or number of stories as regulated by Section 503.1. This is also the case for kiosks. Kiosks are allowed to be constructed of fire-retardant-treated wood in malls of any type of construction (see Section 402.6.2). By logical extension, mezzanine floors should be allowed to be constructed of fire-retardant-treated wood in Types I and II construction.

This code proposal does not alter any of the requirements in Section 505.2 for Mezzanines or the fire-resistance requirements for floor construction per Table 601. For example, in addition to being constructed of fire-retardant-treated wood elements (lumber framing, plywood sheathing, and fireblocking), a mezzanine floor in a Type IIA building would be required to have a 1-hour fire-resistance rating**.**

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal just adds another option to design professionals and clarifies for code officials. All current options in the code are unchanged.

G155-21

G156-21

IBC: 603.1

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

2021 International Building Code

Revise as follows:

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

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

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

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

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

    Exceptions:

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

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

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

    Exceptions:

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

3. Foam plastics in accordance with Chapter 26.
4. *Roof coverings* that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. *Stages* and *platforms* constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.

15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic *veneer* installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.4.4 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.1.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.15 and 1705.16, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect *joints* in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. Wood nailers for parapet flashing and roof cants.
28. <u>Vapor Retarders as required by Section 1404.3</u>

Reason Statement: Vapor retarders are required to be installed in all climate zones. Many times the material is combustible. This has been questioned by some plans examiners when reviewing buildings of Type I and II construction. There is no language in the current code that specifically addresses this issue. We have developed this proposal to clarify that vapor retarders are permitted in these types of construction. The installation of the material does not have any significant impact on the building element in our opinion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since most jurisdictions already permit the vapor retarder in exterior walls of Type I and II construction, this is just intended to clarify that the retarders can be installed and will not affect the cost of construction.

G156-21

G157-21

IBC: 603.1.2

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

2021 International Building Code

Revise as follows:

603.1.2 Piping and plumbing fixtures. The use of combustible piping materials and plumbing fixtures shall be permitted where installed in accordance with the limitations of the *International Mechanical Code* and the *International Plumbing Code*.

Reason Statement: This change is to clarify that plastic plumbing fixtures are acceptable to be installed in Type I and Type II buildings. Fiberglass and acrylic shower compartments are often chosen for these types of buildings to speed construction and lower the cost of construction. Plastic water closets, bathtubs and lavatories are more durable than those of vitreous china and thus are more cost effective in the long run. However, not all jurisdictions are uniformly enforcing the building code because of the misconception that such fixtures are as combustible as common plastic materials. This is not true as the standards for plastic plumbing fixtures require testing for ignitability.
This proposal is submitted by the ICC Building Code Action Committee (BCAC) and developed in cooperation with the PMGCAC.

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

Cost Impact: The code change proposal will decrease the cost of construction
Fiberglass and acrylic shower compartments are much more economical to install because there is a significant installation labor savings over field-constructed tile showers. Other plastic plumbing fixtures generally have a lower cost than their vitreous china counterparts and, being of lighter weight, may provide for some installation labor savings in handling alone.

G157-21

G158-21

IBC: 1202.1

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

2021 International Building Code

Revise as follows:

1202.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1202.5, or mechanical ventilation in accordance with the *International Mechanical Code*.~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour where tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code—Residential Provisions, the *dwelling unit*~~ Dwelling units complying with the air leakage requirements of the *International Energy Conservation Code* or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*. *Ambulatory care facilities* and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the I*nternational Mechanical Code*.

Reason Statement: This proposal is to align the IBC code text with requirements that already exist in the 2021 IMC as a result of M20-18 AS:
401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. *Dwelling units* complying with the air leakage requirements of the *International Energy Conservation Code* or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 *occupancies* shall be ventilated by mechanical means in accordance with Section 407.No requirements are being added or deleted. This is simply a language coordination proposal.

This proposal is a BCAC proposal that was developed with the PMGCAC.

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

Bibliography: M20-18 AS

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirements already exist in the 2021 codes (2021 IMC). This proposal only makes the language for those requirements in both codes read the same. There are no increased or decreased of material or labor associated with this proposal as the requirements have not changed. Thus there is no impact to the cost of construction.

G158-21

G159-21

IBC: 1202.3, TABLE 1202.3

Proponents: Paul Duffy, representing American Chemistry Council - Spray Foam Coalition

2021 International Building Code

Revise as follows:

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

1. The unvented *attic* space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, not less than a $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing *underlayment* above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Insulation shall comply with either Item 5.1 or 5.2, and additionally Item 5.3.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

TABLE 1202.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM *R*-VALUE OF AIR-IMPERMEABLE INSULATION EXPRESSED AS A PERCENTAGE OF TOTAL R-VALUE [a]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	~~R-5~~ 10%
4C	~~R-10~~ 20%
4A, 4B	~~R-15~~ 30%
5	~~R-20~~ 40%
6	~~R-25~~ 50%
7	~~R-30~~ 60%
8	~~R-35~~ 70%

a. Contributes to, but does not supersede, thermal resistance requirements for attic and roof assemblies in Section C402.2.1 of the International Energy Conservation Code.

Reason Statement: Reason:
The existing table in Section 1202.3 was created at a time when the maximum insulation levels contemplated in the most extreme locations covered by the IECC was R-49. In more recent code cycles, insulation requirements have increased and many builders or designers are attempting to go "beyond code" minimums to achieve near zero, net-zero, or even zero energy consumption. The proponents believe the current requirements for minimum R-value of air-impermeable insulation laid out in Table 1202.3 should be expressed as a percentage of the total R-value for each assembly. This approach is intended to maintain a minimum surface temperature at the interface between impermeable and permeable insulation to avoid condensation that may occur in high R-value assemblies if the R-value of air-impermeable insulation is not proportionally increased.

The proposed version of Table 1202.3 was created using the total R-value required in each climate zone in Table 1202.3. The proposed version of Table 1202.3 expresses the required R-value of air-impermeable insulation as a percentage of the original R-value rather than absolute values. See calculations in the attached table.

Insulation for Condensation Control

Climate Zone	Air Impermeable Insulation Req'd	IECC Required Total R-Value	Percentage of Air Impermeable R-Value to Total Insulation R-Value
2B, 3B Tile Roof	0	38	0%
1, 2A, 2B, 3A, 3B, 3C	R-5	R-38	10%
4C	R-10	R-49	20%
4A, 4B	R-15	R-49	30%
5	R-20	R-49	40%
6	R-25	R-49	50%
7	R-30	R-49	60%
8	R-35	R-49	70%

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the table in the section so it can be more broadly applied using sound building science principles.

G159-21

G160-21

IBC: 1202.3

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

2021 International Building Code

Revise as follows:

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

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

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

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

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

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

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

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

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

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

      5.2.2. The port area shall be greater than or equal to ~~1/600~~ 1/150 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement.

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

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

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

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

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

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

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

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

Exceptions:

1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries.
2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.

Reason Statement: I got it wrong in my original proposal. There was an error in converting the measurements. The original work was based on 1:300 and the intention was to double the vent area… Doubling the vent area is really 1:150 not 1:600.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost increase is due to the increase in vent area. The cost increase is small as it increases the size of the vent area - it does not require the addition of vents, only an increase in the size of the vents. Note that having too little

vent area can lead to problems that will have associated costs.

G160-21

G161-21

IBC: TABLE 1202.3

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

2021 International Building Code

Revise as follows:

TABLE 1202.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM *R*-VALUE OF AIR-IMPERMEABLE INSULATION[a]	MINIMUM R-VALUE OF AIR IMPERMEABLE INSULATION[a,b]	MINIMUM RATIO OF AIR IMPERMEABLE R-VALUE TO TOTAL INSULATION R-VALUE[b]
2B and 3B tile roof only [c]	0 (none required)	0 (none required)	Not Applicable
1, 2A, 2B, 3A, 3B, 3C	R-5	R-5	10%
4C	R-10	R-10	20%
4A, 4B	R-15	R-15	30%
5	R-20	R-20	40%
6	R-25	R-25	50%
7	R-30	R-35	60%
8	R-35	R-40	70%

a. Contributes to, but does not supersede, thermal resistance requirements for attic and roof assemblies in Section C402.2.1 of the International Energy Conservation Code.

b. In accordance wtih Section 1202.3 Item 5.1.4.

c. Applicable only to roofs with roofing underlayments that are vapor permeable (greater than 10 perms as tested by ASTM E96, Method B) installed over wood based roof sheathing.

Reason Statement: Previous increases in code attic thermal resistance require the table to be changed. Two additional columns have been added for clarity: Total Insulation R-value and Ratio of Air Impermeable R-value to Total Insulation R-value. The ratio is based on Section 1202.3 (5.1.4) and is noted in the footnote (b). These additional columns show the basis for the insulation requirements to control condensation.
An additional footnote (c) has also been added to clarify that the tile roof condensation control only applies to vapor permeable roofing underlayments. This footnote was not necessary when the original code change was made in the early 2000s as impermeable roof underlayments were not common or available in climate zone 2B OR 3B. Because of changes in available materials and practice this footnote is necessary.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal does not alter the cost of controlling condensation for the existing thermal resistances already in the table. The increase in attic thermal resistance by previously approved code changes resulted in additional costs to provide the additional thermal resistance and also resulted in increased thermal resistance to control condensation and the associated increased costs to provide the increased thermal resistance to control condensation.

G161-21

G162-21

IBC: 1202.7 (New), AARST (New)

Proponents: Thomas Bowles, EPA, representing EPA (bowles.thomas@epa.gov); Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists (janemalonedc@gmail.com); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org)

2021 International Building Code

Add new text as follows:

1202.7 Soil Gas Control: Educational Buildings. Soil gas control systems shall be provided for in Group E educational buildings. Systems shall comply with ANSI-AARST CC1000.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: · *The purpose of this proposed requirement is to protect students, faculty, and other staff from exposure to radon gas in school buildings which are not covered by the International Residential Code and are beyond the scope of the IRC's Appendix F.*

· *Several states (Maine, Nebraska, New Jersey, Oregon, Rhode Island) require soil gas control in schools.*

· *A nationwide survey of radon levels in schools estimates that nearly one in five has at least one schoolroom with a short-term radon level above the EPA action level of 4 pCi/L (picocuries per liter) - the level at which EPA recommends that schools take action to reduce the level.* Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil and is increasingly a liability issue.

· It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

· The standard included in this proposal has been vetted and approved by EPA and multiple regulatory states. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

· More Background on Radon:

· Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. 3 The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. 4 The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer.

The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html**

Bibliography:

- The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html**

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon

control systems are installed if the builder is not already following the standard practice.

According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G162-21

G163-21

IBC: 1202.7, AARST (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

1202.7 Soil gas control systems. Soil gas control systems shall be provided for in Group R-2 apartment buildings. Systems shall comply with ANSI-AARST CC-1000.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists
and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of this proposed requirement is to protect families from exposure to radon gas in apartments in multifamily buildings, which are not covered by the International Residential Code and are beyond the scope of the IRC's Appendix F.
Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil. A requirement for soil gas control in multifamily housing will protect future occupants who will have no authority, capacity, or other means to address excessive radon levels in their homes. It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The awareness of the need to address radon in multifamily buildings is increasing. HUD's multifamily loan program (which finances construction of both market-rate and subsidized properties) requires soil gas control in all new multifamily construction according to ANSI-AARST CC-1000.[1] Several states (Illinois, Minnesota, New Jersey, Oregon, Washington) require soil gas control in the construction of multifamily buildings. Since 2017, the International Green Construction Code, in conjunction with the related standard ASHRAE 189.1, has required soil gas control in new green buildings.

The standard included in this proposal has been vetted and approved by EPA, multiple regulatory states and by HUD (as mentioned above). It can be reviewed at https://standards.aarst.org/CC-1000-2018/index.html. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

More Background on Radon:

Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. 3 The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. 4 The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.

Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer.

[1] US Department of Housing and Urban Development, *Multifamily Accelerated Processing (MAP) Guide*, December 2020, page 9-36. Accessed at

https://www.hud.gov/program_offices/housing/mfh/map/maphome

Cost Impact: The code change proposal will increase the cost of construction
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260.

G163-21

G164-21

IBC: 1202.7, AARST Chapter 35 (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

1202.7 Soil gas control systems. Soil gas control systems shall comply with ANSI-AARST CC1000.

> **Exception:** Radon control systems in one- and two-family dwellings and townhouses shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC.

Add new standard(s) as follows:

AARST

American Association of Radon Scientists and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC1000-2018: Soil Gas Control Systems in New Construction of Buildings.

AARST ANSI-AARST RRNC 2020: Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST RRNC-2020 and AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: · Several states (Illinois, Maine, Minnesota, Nebraska, New Jersey, Oregon, Rhode Island, Washington) require soil gas control in new buildings that cannot possibly be addressed through Appendix F of the International Residential Code, such as schools, child day care facilities, and multifamily housing. Even where there are no requirements, builders are including some form of soil gas control in buildings. The IBC lacks any meaningful provision to oversee soil gas control systems in larger buildings.

While an appendix has been used for this radioactive building hazard in the IRC, lack of appendix adoption in a jurisdiction has meant no enforcement on voluntary systems and no need to comply with standard practices. Placing the specification for how to build soil gas control in the body of the code does not establish a mandate for a soil gas control system; instead, it helps to ensure that those who choose, or are required by state or local policy, to include a soil gas control system adhere to the current professional standard and industry practice. The proposed new subsection 1202.7.1 will make the current standard for soil gas control in large buildings, ANSI-AARST CC-1000-2018 Soil Gas Control Systems in New Construction of Buildings, available as an enforcement tool for code officials and provide consistency among builders, architects, and developers and across jurisdictions.

Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil.

It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The exception allows the use of Appendix F of the IRC, or the applicable current consensus standard ANSI-AARST RRNC 2020, for one- and two-family homes.
he standards included in this proposal have been vetted and approved by EPA, multiple regulatory states, and HUD. In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement. The CC-1000 standard is posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html.**

This proposal is one of six proposals that have been submitted to increase protection from radon this year. The following is noted to clarify how these proposals are inter-related.

Each proposal stands on its own, and It is the proponents' intent that:

(1) If all three proposed additions to Chapter 12 of the IBC (covering Method of soil gas control, educational building requirements, and apartment house requirements) are approved, they would be renumbered in a single new section that would read:

1202.7 Soil gas control systems. Soil gas control systems **s**hall comply with ANSI-AARST CC-1000.

Exception: Radon control systems in one- and two-family buildings shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC**.**

1202.7.1. Apartment houses. Soil gas control systems shall be provided for in Group R-2 apartment buildings.

1202.7.2. Educational buildings. Soil gas control systems shall be provided for in Group E educational buildings.

(2) If the IBC Chapter 12 proposals for apartment buildings and educational buildings are approved but not the Method one, these would be renumbered in a single new section that would read:

1202.7 Soil gas control systems. Soil gas control systems as required below shall comply with ANSI-AARST CC-1000.

1202.7.1. Apartment houses. Soil gas control systems shall be provided for in Group R-2 apartment buildings.

1202.7.2. Educational buildings. Soil gas control systems shall be provided for in Group E educational buildings.

(3) If the IBC Method proposal (new section 1202.7) is approved, the proposed Appendix to the IBC would be redundant.

(4) The proposed revision to IMC Section 512 is not redundant with the Method proposal (IBC proposed new section 1202.7) but instead ensures that the IMC and IBC are consistent and correlated about soil gas control.

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon control systems are installed if the builder is not already following the standard practice.
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G164-21

G165-21

IBC:1204.1.1 (New)

Proponents: Tom Zaremba, representing Glazing Industry Code Committee (tzaremba@ralaw.com); Nicholas Resetar, Roetzel & Andress, representing National Glass Association (nresetar@ralaw.com)

2021 International Building Code

1204.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1204.2 or shall be provided with artificial light in accordance with Section 1204.3. Exterior glazed openings shall open directly onto a *public way* or onto a *yard* or *court* in accordance with Section 1205.

Add new text as follows:

1204.1.1 Classrooms. In Group E occupancies, not less than 50 percent of all classrooms shall be provided with natural light in accordance with Section 1204.2. Artificial light in accordance with Section 1204.3 shall be permitted but shall not substitute for natural light.

Staff Note: G165-21 and G166-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The lighting requirements of Section 1204.1 are acceptable for most occupancies. However, classrooms in Group E-Occupancies are different from any other Occupancy type. Classrooms in E-Occupancies are used primarily for teaching children. During the long hours they spend in classrooms, children are not only learning, but their brains and psychological makeups are developing. To maximize their learning and growth potentials, children **need** natural daylight in classrooms where they are growing and being taught. For example, one study conducted over a one-year period found that both testing and behavioral outcomes are markedly improved when classrooms use natural light. It found that children in classrooms with natural daylighting progressed 20% faster on math testing and 26% faster on reading testing. The research also found that classrooms that provided students with greater amounts of natural light correlated to a 15% to 23% overall improvement in academic outcomes.
Research clearly shows that children in classrooms need natural daylight for optimal development and performance. The adoption of this proposal will ensure that children attending class in our schools will have the best possible opportunity to grow and develop in classrooms lit by the natural light of the sun.

In the 2019 Group A development cycle, a similar proposal was brought forward. While the Committee was supportive of the concept, the proposal was, ultimately, unsuccessful. This proposal is different from the unsuccessful 2019 proposal. First and foremost, since it is unlikely that all classrooms can be located on exterior walls where natural daylight is easily accessed, this proposal limits its natural daylighting mandate to 50% of classrooms. Second, this proposal does **not** include I-4 Occupancies. Finally, this proposal is only intended to apply to new construction, not to any existing E-Occupancies.

Bibliography: Green Building Consultants - (The Benefits of Daylighting in Your Building) https://sigearth.com/the-benefits-of-daylighting-in-your-building/.
National Renewable Energy Laboratory - "Daylighting in Schools: Improving Student Performance and Health at a Price Schools Can Afford" - https://digital.library.unt.edu/ark:/67531/metade712249/

Journal of Educational and Instructional Studies in the World - "Impact of Daylighting on Student and Teacher Performance" - https://www.researchgate.net/publication/301284909_The_impact_of_daylighting_in_classrooms_on_students'_performance

International Conference on "Health, Biological and Life Science" - "Natural Light and Productivity: Analyze the Impacts of Daylighting on Students' and Workers' Health and Alertness" - http://scholar.google.com/scholar_url?
=https://www.researchgate.net/profile/Nastaran_Shishegar/publication/303484362_Natural_Light_and-
Productivity_Analyzing_the_impacts_of_daylighting_on_students%27_and_Workers%27_Health_and_Alertness/links/5744aa1608ae9f741b407f8f.pdf&
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National Renewable Energy Laboratory - "A Literature of the Effects of Natural Light on Building Occupants" - http://scholar.google.com/scholar_url?
url=https://www.osti.gov/servlets/purl/15000841&h1=en&sa=X&ei=3y3eX9aOK4fPmAGK94aACg&scisig=AAGBfm25rM8uusi4kS6H9KOyrtAUVr7FrQ&

Miassar Mohammed Bakri - University of Nottingham - "Daylighting Strategies in Educational Spaces" - https://www.researchgate.net/publication/288181980_DAYLIGHTING_STRATEGIES_IN_EDUCATIONAL_SPACES

Angela Read - Rochester Institute of Technology - "Integration of Daylighting into Educational (School) Building Design for Energy Efficiency, Health Benefit, and Mercury Emissions Reduction Using Heliodon for Physical Modeling" - http://scholarworks.rit.edu/cgi/viewcontent.cgi?
article=10826&context=theses

Cost Impact: The code change proposal will increase the cost of construction
This proposal could increase the cost of construction if additional windows must be added to the building's exterior in order to comply with the proposal.

G165-21

G166-21

IBC: 1204.1, 1204.1.1 (New)

Proponents: Thomas Culp, Ph.D., Birch Point Consulting LLC, representing self and the Aluminum Extruders Council (culp@birchpointconsulting.com)

2021 International Building Code

1204.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1204.2 or shall be provided with artificial light in accordance with Section 1204.3. Exterior glazed openings shall open directly onto a *public way* or onto a *yard* or *court* in accordance with Section 1205.

Add new text as follows:

1204.1.1 Classrooms. In Group E occupancies, classrooms with combined total *net floor area* not less than 50 percent of the total *net floor area* of all classrooms shall be provided with natural light in accordance with Section 1204.2. Artificial light in accordance with Section 1204.3 shall be permitted as a supplement, but not as a substitute for natural light.

Staff Note: G165-21 and G166-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Imagine a child trying to learn in a classroom with no windows and no natural daylight.
Access to natural daylight and views is an essential and fundamental element of a healthy and productive indoor environment, especially in school settings where natural daylight and views increase student learning, and improve well-being and health for teachers, students, and staff. Studies have shown that spaces with improved views and daylighting increased student test scores by 21%, increased student learning rates in math and English by 20-26%, improved student behavior, increased teacher retention, and increased attendance for both students and teachers. For these reasons, this proposal would require that 50% of total classroom floor area in Group E occupancies be provided with natural light per Section 1204.1. Artificial lighting can and will still be used of course, but only in addition to natural lighting.

The committee expressed support for the intent of a similar proposal from another proponent last cycle, but also expressed concerns about certain situations such as where classrooms cannot be located on an exterior wall, classrooms in church basements, and small home daycare. Applying the requirement to only 50% of the total net floor area of classrooms allows flexibility in the first case as well as for other circumstances where it may be undesired such as music classrooms. Classrooms in church basements and small daycare in homes are not in Group E, and therefore not affected. This is also only for new construction under the IBC, not existing building alterations covered under the IEBC.

Net floor area was chosen as the appropriate term as it is directly related to the occupied area where natural light is critical, and does not include unoccupied accessory areas such as closets that are not relevant to natural lighting. Net floor area is also readily available from common architectural design software packages.

We ask for your support for this proposal to add an important base level requirement that will improve the health, well-being, and performance of our precious students and educators.

Bibliography:

Heschong-Mahone Group. “Windows and Classrooms: A Study of Student Performance and the Indoor Environment.” Integrated Energy Systems: Productivity and Building Science Program. Sacramento: California Energy Commission, 2003. http://h-m-g.com/downloads/Daylighting/order_daylighting.htm

“Re-Analysis Report, Daylighting in Schools”, for the California Energy Commission, published by New Buildings Institute, 2001. https://www.pge.com/includes/docs/pdfs/shared/edusafety/training/pec/daylight/DL_Schools_Re-analysis.pdf

Heschong- Mahone Group “Daylighting in Schools. An investigation into the relationship between daylight and human performance.” for Pacific Gas & Electric, 1999. https://www.glass.org/sites/default/files/2020-09/HMG%20Daylighting%20Initiative.pdf

Edwards, L. and P. Torcellini. “A Literature Review of the Effects of Natural Light on Building Occupants.” (NREL/TP- 550-30769) National Renewable Energy Laboratory, 2002. https://www.glass.org/sites/default/files/2020-09/lbnl_human_factors_study_relating_to_natural_light_-_30769.pdf

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

Where school project designs already have at least 50% of classrooms located with exterior walls and windows, this proposal will not increase the cost of construction. For very rare situations where more than 50% of classrooms in the initial design lack either an exterior wall or skylight roof access, redesign costs may be incurred to correct the project layout to provide adequate natural light.

G167-21

IBC: 1206.4(New), 1206.4.1(New), ASA CHAPTER 35 (New)

Proponents: Samantha Rawlings, representing Veneklasen Associates (srawlings@veneklasen.com)

2021 International Building Code

SECTION 1206 SOUND TRANSMISSION.

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

Add new text as follows:

1206.4 Exterior-to-Interior Sound. For Group R-2 occupancies where the exterior sound level at any façade exceeds a Day-Night Level (DNL, per ANSI/ASA S1.1) of 65, interior sound levels attributable to exterior sources shall not exceed a DNL of 45 in any *habitable space*. All projects where the exterior sound level at any facade exceeds a DNL of 65 shall complete an acoustical assessment to identify minimum acoustical requirements for exterior façade assemblies to comply with the allowable noise levels. Worst-case sound levels, for either the existing or future condition, shall be used as the basis for determining compliance with this section. Future sound levels shall be assessed for a period of 10 years from the time of building permit application.

1206.4.1 Field Verification. Field verification, where required, shall be completed by monitoring exterior-source sound levels within a completed building for a minimum 24-hour period in accordance with ANSI/ASA S1.13. Measurements within unfurnished units shall be normalized to a receiving room reverberation time of 0.5 seconds. Measurements within furnished units shall not be normalized.

Add new standard(s) as follows:

ASA

Acoustical Society of America
1305 Walt Whitman Road Suite 300
Melville NY 11747
USA

ASA Acoustical Society of America. ANSI/ASA S1.1-2013 American National Standard Acoustic Terminology

ASA Acoustical Society of America. ANSI/ASA S1.13-2020 American National Standard Measurement of Sound Pressure Levels in Air

Staff Analysis: A review of the standards proposed for inclusion in the code, ANSI/ASA S1.1-2013 and ANSI/ASA S1.13-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Multifamily housing facilities are common in urban areas where exterior noise exists at levels that can be injurious to occupant health and welfare. Negative health effects as a result of long-term noise exposure and sleep disturbance include reduced quality of sleep and early wakening, increased stress hormone levels, high blood pressure, obesity, and cardiovascular disease. According to the referenced study, the injurious effects appear to begin at nighttime noise levels of 35 dBA, which roughly corresponds to a DNL of 45. Limiting the maximum noise level in buildings used for sleeping, particularly buildings intended for long-term occupants, promotes public health within communities.
The proposed performance thresholds are based on the Department of Housing and Urban Development (HUD) criteria which have been in use for more than 50 years. An acoustical façade assessment, such as is required with this proposal, is currently required for all projects pursuing HUD funding. The importance of a quiet environment is prioritized such that sites that are excessively noisy (>75 DNL) are prohibited from receiving funding from HUD. Similar language has been included in the California Building Code (CBC) since the 1970's to protect occupants in noisy urban environments.

This code proposal is designed to promote public health by targeting projects where occupants would be exposed to high long-term noise levels. It applies only to Group R-2 occupancies, which includes permanent multifamily housing, and exempts hotels and other types of transient housing. It also includes a provision that quiet sites would be exempt from providing an analysis or upgrading facades, limiting the impact on those projects to a minimal effort to determine what the sound levels at the facades would be. This provision targets projects that are located on noisy sites where protection is warranted, such as near freeways, large arterials, rail traffic, and/or air traffic. It further minimizes cost to projects by establishing a performance basis (maximum interior sound level) so upgraded window assemblies would not be required for facades with exterior sound levels below 65 DNL.

Bibliography: World Health Organization, "Night Noise Guidelines for Europe," 2009

Cost Impact: The code change proposal will increase the cost of construction
In order to understand the impact on the design and construction of the code proposal, the proponent reviewed a sample of projects across the nation where the interior sound level standard was implemented. The projects reviewed were located along both coasts, the southwest, southeast, Midwest, and in the Rocky Mountain regions, representing a sampling of urban and suburban multifamily occupancies across a variety of geographic locations. This review revealed:

- 60% of facades were equal to or below 65 LDN, requiring no change to façade design.
- 11% of facades had windows with STC ratings 29-31
- 17% of facades had windows with STC ratings 32-35
- 8% of facades had windows with STC ratings 36-38
- 4% of facades had windows with STC ratings higher than 38

Cost to projects includes an acoustical survey (approx. $500/project). For sites where the sound level at a façade exceeds 65 DNL, an acoustical assessment would be required ($1000-$3000/project). Sites that complete assessments can anticipate an upgraded exterior window assembly on at least one façade, for which the cost of windows is anticipated to increase by $300/unit on average.

G167-21

G168-21

IBC: 1206.2, 1206.3

Proponents: Samantha Rawlings, Veneklasen Associates, representing Veneklasen Associates (srawlings@veneklasen.com)

2021 International Building Code

CHAPTER 12
INTERIOR ENVIRONMENT

SECTION 1206 SOUND TRANSMISSION.

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Engineering analysis shall be performed by a *registered design professional* having either Board Certification through the Institute of Noise Control Engineering-USA (INCE-USA) or a Professional Engineering license in Acoustics. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 302 or determined through testing in accordance with ASTM E90.

Revise as follows:

1206.3 Structure-borne sound. Floor-ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492. Engineering analysis shall be performed by a *registered design professional* having either Board Certification through the Institute of Noise Control Engineering-USA (INCE-USA) or a Professional Engineering license in Acoustics.

Reason Statement: This section of the code is proposed to clarify for the AHJ the qualifications necessary for a design professional to provide accurate engineering judgment in acoustical design. This stipulation is necessary because of the frequency of permitting and construction that occurs using non-code-compliant assemblies as a result of inaccurate engineering judgments. Architects, contractors, structural engineers, mechanical engineers, and other licensed engineers do not have the specialization required to assess assembly acoustical performance and therefore should not be offering these judgments. Examples of design failures include:

· BTC Residential, LLC vs. Hacker Industries. The referenced tested floor-ceiling assembly was modified by changing the type of truss used from wood to wood-steel composite and changed resilient channel product. The assembly failed to meet minimum code performance post-construction. The floor matting manufacturer was sued but the case was settled in the manufacturer's favor as it was demonstrated that the failure was due to design errors.

· Homeowners successfully sued the developer of a project in Minneapolis due to failing impact isolation of the floor-ceiling assembly. It was demonstrated that the acoustical failure was due to excess floor excitation as a result of long joist span and use of double-leg resilient channels in lieu of single-leg resilient channels.

· Walls permitted under GA File WP 3245 (and similar), with a shear layer added between the stud and the resilient channel, sandwiching the channel between the shear layer and gypsum board layer. This configuration reduces performance of the assembly below the required STC-50 by reducing the channel's effectiveness. This exact design configuration was included architectural drawings dated December 2020 and identified as being code-compliant to the AHJ, even though it is not.

· Walls permitted under GA File WP 1021 (and similar), where the stud gauge is reduced below 24 inches on center and/or the stud gauge is heavier than 25 gauge. The change to stud gauge or spacing reduces the wall's performance below the required STC-50.

· Double-stud walls permitted under GA file WP 3820 (and similar), where shear layers are installed in the interior cavity rather than on the exterior of the wall. With an interior shear layer on each side of the cavity, the STC rating falls below 50.

· Walls permitted under GA file WP 3239 (and similar), where two 1-hour walls are placed side-by-side to create a 2-hour assembly (i.e. for townhome construction). With a narrow airspace between the two walls (less than 3 inches), the rating of the combined assemblies is below 50.

Recognizing the need to identify qualified professionals in the acoustics specialization, the proposed language identifies two qualifications, of which a registered design professional is required to hold one, to provide engineering judgments under this section: a Professional Engineering license specific to the discipline of Acoustics, or Board Certification in Acoustical Design offered by the Institute of Noise Control Engineers-USA. These qualifications have been specified based on the Committee's comments to previous drafts of this language to ensure that AHJ's can identify professionals who are qualified to offer a judgment.

Bibliography: Shafer, B., "Laboratory sound transmission loss testing for steel-framed partitions II: Stud spacing and steel material properties" The Journal of the Acoustical Society of America 146, 2766 (2019); https://doi.org/10.1121/1.5136579.
LoVerde, J., Dong, W., "Quantitative comparisons of resilient channel design and installation in single wood stud walls," Proceedings of the 10th International Congress on Acoustics, ICA 2010, Sydney.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not represent a cost impact to projects since there are existing libraries of tested assemblies that can be referenced and used for projects without requiring engineering judgments or the hiring of an acoustical design professional.

G168-21

G169-21

IBC: 1206.2, 1206.3

Proponents: David Dong, Veneklasen Associates, Inc., representing Veneklasen Associates, Inc. (wdong@veneklasen.com)

2021 International Building Code

Revise as follows:

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Engineering analysis shall be performed by a *registered design professional*. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.3 Structure-borne sound. Floor-ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492. Engineering analysis shall be performed by a *registered design professional*.

Reason Statement: This section of the code is proposed to ensure that the individual completing the engineering analysis has the necessary qualifications to provide accurate engineering judgment in acoustical design. This stipulation is necessary because of the frequency of permitting and construction that occurs using non-code-compliant assemblies as a result of inaccurate engineering judgments. Architects, contractors, structural engineers, mechanical engineers, and other licensed engineers do not have the specialization required to assess assembly acoustical performance and therefore should not be offering these judgments. Examples of design failures include:

- BTC Residential, LLC vs. Hacker Industries. The referenced tested floor-ceiling assembly was modified by changing the type of truss used from wood to wood-steel composite and changed resilient channel product. The assembly failed to meet minimum code performance post-construction. The floor matting manufacturer was sued but the case was settled in the manufacturer’s favor as it was demonstrated that the failure was due to design errors.
- Homeowners successfully sued the developer of a project in Minneapolis due to failing impact isolation of the floor-ceiling assembly. It was demonstrated that the acoustical failure was due to excess floor excitation as a result of long joist span and use of double-leg resilient channels in lieu of single-leg resilient channels.
- Walls permitted under GA File WP 3245 (and similar), with a shear layer added between the stud and the resilient channel, sandwiching the channel between the shear layer and gypsum board layer. This configuration reduces performance of the assembly below the required STC-50 by reducing the channel’s effectiveness. This exact design configuration was included architectural drawings dated December 2020 and identified as being code-compliant to the AHJ, even though it is not.
- Walls permitted under GA File WP 1021 (and similar), where the stud gauge is reduced below 24 inches on center and/or the stud gauge is heavier than 25 gauge. The change to stud gauge or spacing reduces the wall’s performance below the required STC-50.
- Double-stud walls permitted under GA file WP 3820 (and similar), where shear layers are installed in the interior cavity rather than on the exterior of the wall. With an interior shear layer on each side of the cavity, the STC rating falls below 50.
- Walls permitted under GA file WP 3239 (and similar), where two 1-hour walls are placed side-by-side to create a 2-hour assembly (i.e. for townhome construction). With a narrow airspace between the two walls (less than 3 inches), the rating of the combined assemblies is below 50.

This language is parallel to section 909.9.

Bibliography: Shafer, B., “Laboratory sound transmission loss testing for steel-framed partitions II: Stud spacing and steel material properties” The Journal of the Acoustical Society of America 146, 2766 (2019); https://doi.org/10.1121/1.5136579.
LoVerde, J., Dong, W., "Quantitative comparisons of resilient channel design and installation in single wood stud walls," Proceedings of the 10th International Congress on Acoustics, ICA 2010, Sydney.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not represent a cost impact to projects since there are existing libraries of tested assemblies that can be referenced and used for projects without requiring engineering judgments or the hiring of an acoustical design professional.

G170-21

IBC: 1206.3

Proponents: Cesar Lujan, National Association of Home Builders, representing National Association of Home Builders (clujan@nahb.org)

2021 International Building Code

1206.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas.

1206.2 Airborne sound. Walls, partitions and floor-ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class of not less than 50 where tested in accordance with ASTM E90, or have a Normalized Noise Isolation Class (NNIC) rating of not less than 45 if field tested, in accordance with ASTM E336 for airborne noise. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1206.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 302 or determined through testing in accordance with ASTM E90.

Revise as follows:

1206.3 Impact Sound Transmission. Floor-ceiling assemblies between*dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class rating of not less than 50 where tested in accordance with ASTM E492, or have a Normalized Impact Sound Rating (NISR) of not less than 45 if field tested in accordance with ASTM E1007. Alternatively, the impact insulation class of floor-ceiling assemblies shall be established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492.

> **Exception:** Floor/ceiling assemblies between a dwelling unit or sleeping unit and a public or service area shall not be required to have an impact insulation rating, or have a normalized impact sound rating (NISR), where the ambient noise within any public or service space will be unaffected by impact noise from the dwelling unit or sleeping unit above.

Reason Statement: Normalized Impact Sound Ratings (NISR) and impact insulation class (IIC) rate the structure-borne impact sound transmission between floor/ceiling assemblies, such as the sound of an object dropping on a floor. Impact sounds between dwelling units is mitigated by the requirements of the current code language to protect inhabitants from unwanted impact noise, as is airborne sound from adjacent spaces. Theoretically, an impact sound from a *dwelling unit* or *sleeping unit* would minimally affect a public or service area below since those spaces are either occupied and have various levels of noise from occupants/users (public area) or are not occupied spaces (service area). Examples include, but are not limited to arcades, bowling alleys, and other commercial and business uses.

This code change would only affect the requirements for impact sound and not the airborne sound requirements The airborne sound requirements in Section 1206.2 for floor/ceiling assemblies shall still apply to protect *dwelling units* and *sleeping units* located above a public or service area from sound transmission created by airborne sounds (i.e. sound from appliances, tv's, talking, etc).

Cost Impact: The code change proposal will decrease the cost of construction

The structure-borne sound requirements for floor/ceiling assemblies between *dwelling units* or *sleeping units* with public or service areas below, cost an average between $8,000 to $15,000 per dwelling unit if an IIC rating or NISR rating is required. The added exception is proposed language that would only affect the floor/ceiling assemblies where a dwelling unit or sleeping unit is located above a public or service area.

G170-21

G171-21

IBC: 1208.3, 1208.4

Proponents: Jenifer Gilliland, representing Washington Association of Building Officials (jenifer.gilliland@seattle.gov); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

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[BG] DWELLING UNIT, EFFICIENCY. A *dwelling unit* where all permanent provisions for living, sleeping, eating and cooking are contained in a single room.

Add new text as follows:

1208.3 Dwelling unit size. Dwelling units shall have a minimum of 190 square feet (17.7 m^2) of habitable space.

Revise as follows:

1208.4 ~~1208.3~~ Room area. Every *dwelling unit* shall have not less than one room that shall have not less than 120 square feet (11.2 m^2) of *net floor area*. *Sleeping units* and other habitable rooms of a *dwelling unit* shall have a *net floor area* of not less than 70 square feet (6.5 m^2).

Exception: Kitchens are not required to be of a minimum floor area.

1208.5 ~~1208.4~~ Efficiency dwelling units. *Efficiency dwelling units* shall conform to the requirements of the code except as modified herein:

1. The unit habitable space shall ~~have a living room of not less than 190 square feet (17.7 m²) of floor area~~ comply with Sections 1207.1 through 1207.4.
2. The unit shall be provided with a separate closet.
3. For other than *Accessible*, Type A and Type B dwelling units, the unit shall be provided with a kitchen sink, cooking appliance and refrigerator, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

Reason Statement: This proposal standardizes the minimum size requirements for all dwelling units. The code as currently written can be interpreted to allow a one-bedroom unit to be smaller than an efficiency dwelling unit. This change makes it clear that a dwelling unit and efficiency dwelling unit are subject to the same size limitations. It also clarifies that sleeping units are subject to the same minimum size requirements as habitable rooms in dwelling units.

Cost Impact: The code change proposal will decrease the cost of construction
This code change would decrease the cost of developing a one bedroom unit because it will not be treated differently from an EDU as far as size is concerned. It would also allow developers more choices of unit type.

G171-21

G172-21

IBC: (New), 1210.3 (New), 1210.3.1 (New), 1012.3.1.1 (New), 1012.3.1.2 (New), 1210.3.2 (New), 1210.3.2.1 (New), 1210.3.2.2 (New), 1210.3.3 (New), 1210.3.3.1 (New), 1210.3.3.2 (New), 1210.3.3.3 (New), 1210.3.4 (New), 1210.3.4.1 (New), 1210.3.4.2 (New), 1210.3.4.3 (New), 1210.3.4.4 (New), 1210.3.4.5 (New)

Proponents: Jake Pauls, representing Myself (bldguse@aol.com)

2021 International Building Code

Add new definition as follows:

STANCHION. . An often vertical, tubular structure serving as a hand-grasped, point of control that is fixed between separate supporting structures such as surfaces or other railings, as opposed to being mounted, in cantilever fashion, on walls as occurs with conventional grab bars.

Add new text as follows:

1210.3 Grab bars and stanchions at bathtubs and showers in Groups R-1, R-2, R-3 and R-4. Bathtubs in Groups R-1, R-2, R-3 and R-4 occupancies shall be provided with grab bars or stanchions complying with Section 1210.3.1, 12010.3.2 and 12010.3.4. Showers in Groups R-1, R-2, R-3 and R-4 shall be provided with a grab bar or stanchion complying with Section 1210.3.3 and 1210.3.4.

Exception: Accessible units complying with ICC A117.1 Section 1102.11 are not required to comply with this section.

1210.3.1 Grab bar or stanchion at the access side to bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided at the access side to each bathtub and shower/bathtub combination in accordance with Section 1210.3.1.1 or 1210.3.1.2. Location dimensions, except as provided for spacing in Section 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section 1210.3.4.1.

1012.3.1.1 End wall grab bar. A vertical grab bar on one end wall of the bathtub shall be provided between 9 inches (230 mm) and 12 inches (305 mm) horizontally, inward from the access side of the bathtub. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor.

1012.3.1.2 Bathtub access side, grab bar or stanchion. A vertical grab bar or a vertical stanchion shall be provided within 2 inches (51 mm) maximum inward, and within 6 inches (152 mm) maximum outward, from the access side of the bathtub. The grab bar or stanchion shall be located 2 inches (51 mm) minimum, horizontally, from the centerline of any shower curtain rod installation. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor.

1210.3.2 Grab bar and stanchion at the back wall, or non-access side, of bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided on the back wall, or non-access side of each bathtub and shower/bathtub combination in accordance with Section 1210.3.2.1 or 1210.3.2.2. Location dimensions, except as provided for spacing in Section1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section 1210.3.4.1.

Exception: For relatively deep bathtubs, where the required centerline height for the overall or lower end height exceeds 24 inches (610 mm) above the adjacent finished floor elevation, the centerline height shall be permitted to be 3 inches (76 mm) maximum above the bathtub rim height.

1210.3.2.1 Horizontal grab bar or stanchion. A grab bar 36 inches (910 mm) minimum in length, centered, plus or minus two inches (51 mm), along the length of the bathtub, or a full-length stanchion installed between end walls. Its height above the bathtub rim shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum.

1210.3.2.2 Diagonal grab bar. A grab bar shall be installed in a diagonal position with its angle, to horizontal, 30 degrees minimum and 60 degrees maximum. The diagonal grab bar shall have the higher end located 12 inches (305 mm) maximum from the control end wall, measured horizontally. The lower end shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum above the bathtub rim.

1210.3.3 Grab bar or stanchion at the access to showers. A grab bar or stanchion shall be provided for the shower in accordance with Section 1210.3.3.1 or 1210.3.3.2. or 1210.3.3.3. Location dimensions, except as provided for spacing in Section 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with Section1210.3.4.1.

1210.3.3.1 At shower exterior. A vertical grab bar or stanchion shall be provided outside of the shower compartment, adjacent to the access opening. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor.

1210.3.3.2 For smaller shower interior. For showers with interior plan dimensions, including diagonally between corners, 51 inches (1295 mm) maximum, a vertical grab bar shall be provided, interior to the shower compartment, 30 inches (762 mm) maximum, measured horizontally from the control wall on the side closest to the access opening. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower.

1210.3.3.3 For larger shower interior. For showers with any interior plan dimensions exceeding 51 inches (1295 mm), including diagonally between corners, a grab bar or stanchion located interior to the shower compartment shall be 30 inches (762 mm) maximum, measured horizontally to the access to the shower. If oriented vertically, the grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. If oriented horizontally, the grab bar or stanchion shall have a length 36 inches (915 mm) minimum at a height, measured vertically above the finished floor outside the shower, of 48 inches (1220 mm) minimum and 60 inches (1524 mm) maximum.

1210.3.4 Grab bar and stanchion requirements. Grab bars and stanchions, shall comply with Section 1210.3.4.1 through 1210.3.4.5.

1210.3.4.1 Cross section. Grab bars and stanchions shall have a cross section complying with one of the following:

1. A circular cross section with an outside diameter of 1-1/4 inch (32 mm) minimum and 2 inches (51 mm) maximum.
2. A noncircular cross section complying with ICC A117.1.

1210.3.4.2 Spacing. The space between a grab bar or stanchion and any adjacent surface, including the closest surfaces of fixed, sliding or swinging panel enclosure system provided to prevent water migration on the access side of a bathtub or shower, shall be 1-1/2 inches (38 mm) minimum.

1210.3.4.3 Surface Hazards. Grab bars or stanchions and adjacent surfaces shall be free of sharp or abrasive elements. Edges shall be rounded.

1210.3.4.4 Structural characteristics. Grab bars and stanchions shall be designed and constructed for the structural loading conditions set forth in Section 1607.8.2.

1210.3.4.5 Moisture. Grab bars and stanchions, including mountings, shall be installed and sealed, or provided with permanent drainage such as weep holes for components subject to water intrusion, to protect structural elements from moisture.

Reason Statement: SECTION 202. DEFINITIONS: Stanchion.
An often vertical, tubular structure serving as a hand-grasped, point of control that is fixed between separate supporting structures, surfaces or other railings as opposed to being mounted, in cantilever fashion, on walls as occurs with conventional grab bars.

Brief Introduction to, and Demonstrating Use of, Stanchions and Points of Control. Stanchions have a long history beginning—especially in a facility safety engineering sense—with transportation vehicles such as buses and many intensive-occupancy trains.

See examples below of early stanchions dating back about 100 to 200 years, as photographed in 2018 at the London Transport Museum in London. The first example is of one of the earliest stanchions, likely a wrought iron, vertically-oriented rod, on a horse-drawn, omnibus carrying up to 22 passengers. Next to it are examples of stanchions dating back about 100 years and, at the right side, about one year ago, in a Canadian light rail train car.



Not very long after the first example, such vehicles started carrying passengers on the roof level reached by a ladder in relatively rare examples and soon a helical stair became quite standard with relatively good railings on each side.

The central handrail for such helical stairs was often a nearly straight, vertical stanchion. Stair steps had more than a 50-degree pitch at the center of the stair width with risers sometimes well over a foot in height.

They were well equipped with handholds which were used by ascending and descending passengers often with three Points of Control, e.g., both hands on railings to either side and at least one foot planted on the small treads.

The sequence of photos below demonstrate not just the range of numbers of Points of Control achieved by adults and children on one of the historic trams (about a hundred years old) in the London Transport Museum. When examined carefully, the photos bring new realizations of what typical users of facilities provided with stanchions do with them and what that means for the technical details we will see in this proposal for grab bars and stanchions in the IBC.

The woman at the right is traversing a step height of 16 inches, as is the young boy. This is comparable to what is needed to step up and over a bathtub wall.

Stanchions predate the relatively recent conventional, wall-mounted grab bars (for which an early example is installed on the tram's end wall adjacent to the woman's left arm. Note that the woman has chosen to grasp a point on the stanchion, with her right hand, at a height that would be at the top of the very short-length grab bar and thus only marginally useful with her left hand.

The people in the sequence of photographs (above) taken at the London Museum, include a very young boy and his mother, traversing two steps each in excess of one foot rise—indeed, the second step is has a full 16 inch (406 mm) rise. Note the young boy's most-effective handholds are at the elevation of his head; both children and adults instinctively know how high the more effective points of control are. (Now if adults drafting and applying point of control would only apply the same lessons learned early in life at about age 12 months.) Moreover the boy maintains a minimum of three points of control in both ascent and descent—*to the full extent the available railings—mostly vertical stanchions—allow.* I was able to capture images of children, as well as some adults using the railings with the precarious underfoot challenges (comparable in a way to what bathers need to do). Note these photos were not staged in any way; the are completely spontaneous with absolutely no communication between camera operator and subjects photographed who were unaware of the photography.

The boy, shown in his ascent of the both stairs leading to the upper level seating, would have had difficulty if he had attempted to use the short grab bar instead of the full-length stanchion. He would only have been able to reach the grab bar from a position on the first tread, not from the ground level. Both of his hands are grasping a stanchion in the first photo; his left hand is at about the elevation of his head (and thus hidden from the camera's view). You can see this is the situation shown in the last of the three photos; his left hand is reaching for a head-height grasp on a stanchion to his left while his right hand is at about his shoulder height.

An important lesson, from the photo sequence above, is that stanchions provide more options for placement and more options for users to choose the points of control they perceive as important to their task and safety. In other words ordinary people, even of young age, are displaying skill in ergonomics (the science and technology of how people utilize things, systems, etc. available to them to perform tasks efficiently and safely).

Now, for purposes of this IBC proposal, along with grab bars, it should be clear that stanchions are reliable, indeed superior, time-tested means of providing for "points of control" and they provide options for location and length that greatly exceed what conventional grab bars can provide.

Comparing Points of Control Quantitatively.

Grab bars, handrails and stanchions are important building components (and some mobility aids such as walkers) providing—in combination with our hands and our feet—what are called (in ergonomics) "points of control" to maintain balance and aid in ambulation and other movement activities that are crucial to utilizing means of egress, for example, for safety generally (in both normal and emergency conditions) and which pose dangers of injurious falls, the leading source of injuries in most countries, including the USA.

Regarding ergonomics as a basis for regulating movement task safety, today, three points of control are the minimum acceptable standard for occupational settings in the USA for ladders, etc., including the minimal footholds and handholds that truck drivers (accessing and leaving their high-off-the-ground truck cabs) have learned to climb up and down safety by exercising, continuously, provision of three points of control; i.e., with only one extremity (or four) in motion at any one time. The table below describes the full range of points of control provided in several contexts.

Number of Points of Control Via Hands or Feet	≤1	1	2	3	3-4
Standard walker for older adult with altered gait.					✔
Occupational settings with risk of worker falls from heights. Also, stairs where users can use two handrails simultaneously, one on each side.				✔	
Stairs where users have only a single handrail. ***Grab bar(s) usable for bathtub/shower entry/egress.***			✔ ★		
Bathtubs/showers with slip resistant underfoot surfaces when wet.		✔			
Bathtubs/showers without slip resistant underfoot surfaces when wet, the common condition currently.	✔				

Having introduced some key terminology related to Points of Control, we move to the proposal for a new Section of requirements for the International Building Code in which, currently, the requirements for points of control for bathing and showering facilities exist in the lower left corner of the Table shown above. The proposal of several new requirements follows next, along with supplementary text expanding on what is being required, how the requirements can be implemented, and what are the benefits and costs of doing so (as NFPA 101 plus NFPA 5000) have been doing since 2018 and the *National Building Code of Canada* has parallel new requirements proposed (and formally, publicly reviewed) for its 2020 edition (which is slated for publication later in 2021, a delay brought on by the COVID-19 pandemic).

IBC SECTION

1210

TOILET AND BATHROOM REQUIREMENTS

. . . .

1210.3 Grab bars and stanchions at bathtubs and showers in Groups R-1, R-2 R-3 and R-4. Bathtubs in Groups R-1, R-2, R-3 and R-4 occupancies shall be provided with grab bars and/or stanchions complying with Section 1210.3.1, 12010.3.2 and 12010.3.4. Showers in Groups R-1, R-2, R-3 and R-4 shall be provided with a grab bar or stanchion complying with Section 1210.3.3 and 1210.3.4.

Exception: Accessible units complying with ICC A117.1 Section 1102.11 are not required to comply with this section.

A separate proposal for the IBC is being submitted as a “fall back” in the event ICC members are unhappy with these new requirements for grab bars and stanchions. It references the current requirements, for grab bars and stanchions, in NFPA 101 (and 5000), 2021 edition, after being first published in their 2018 editions. The NFPA requirements include broader scoping that extends what is proposed here for residential and includes all the residential settings listed here for the IBC as well as for the IRC which will be addressed in ICC’s Group B proposal review in 2022 (also for the 2024 edition for which this scoping is proposed for the IBC).

The largest number of approximately one million-plus professionally treated injuries annually in the USA, arising from fall events in bathing and showering facilities occur in residential settings.

See the extract from the best recent published paper on injury epidemiology involving consumer products, including the top two—stairs and bathtubs/showers—that are (or should be) regulated with improved building code requirements. The table below is extracted from Table 2 in the publication: Lawrence B, Spicer R, Miller T. A fresh look at the costs of non-fatal consumer product injuries. *Injury Prevention* 2015; **21**:23-29. It shows products that are covered by building codes; this accounts for the omission, in this extract, of products ranked between 13 and 27.

Note that the “bathtubs/showers” category does not include “Toilets” which has its own data; neither does the “bathtubs/showers” category include scald-related injuries for which CPSC/NEISS has a separate coding.

Table 2 Leading products involved in injury, ranked by non-fatal injury cost, 2009–2010 (2009 dollars)

Rank	Product	Annual total cost ($)	Percentage	Annual incidence	Mean cost ($)
1	Stairs	92 294 000 000	10.1	1 231 619	74 937
2	Floors	81 233 000 000	8.9	941 296	86 299
3	Beds	44 192 000 000	4.9	612 658	72 131
4	Bicycles	38 898 000 000	4.3	536 360	72 521
5	Football	27 127 000 000	3.0	467 575	58 016
6	Basketball	25 677 000 000	2.8	508 167	50 529
7	Chairs	22 377 000 000	2.5	335 180	66 761
8	Bathtubs/showers	19 723 000 000	2.2	262 849	75 037
9	Ladders	18 662 000 000	2.1	179 195	104 144
10	Exercise (w/o equipment)	16 135 000 000	1.8	211 682	76 224
11	Doors	15 914 000 000	1.7	334 868	47 522
12	Ceilings and walls	15 545 000 000	1.7	288 755	53 833
28	Toilets	6 691 000 000	0.7	77 675	86 145

The available data from US CPSC NEISS (National Electronic Injury Surveillance System) are not fine grained enough to assign injuries to the subgroups of R1, R2, R3, and R4 occupancies (along with the likely biggest culprit, one and two-family dwellings). Injury treatment professionals (who provide the basic data collection for NEISS) are already too busy and not trained in the arcane topic of occupancy classification to provide the fine-grained location data some might like to have. (The current COVID pandemic means this shortcoming is even more pronounced.)

Thus, more-basic criteria based on etiology, epidemiology, ergonomics and economics must be used. To make a long complex story short, the public health approach has to be founded on basic equity we deserve, with this daily or otherwise frequent exposure to dangers of baths and showers.

The most dangerous aspect of “exposure to dangers of baths and showers” occurs in only a relatively few seconds—the transfers into and out of bathtubs and showers, unlike exposure to stairs which accounts for many seconds per day per person. Thus exposure to injury per use, e.g., only as much as an average one bathtub or shower use per day per residential occupant must be recognized.

With such correction for exposure, the injury risk for bathtubs/showers is in the same league as stairs. This is the most important factor to be kept in mind when considering the scoping for the new grab bar and stanchion requirements, the sole focus of IBC section 1210.3. Moreover, as is clear in the epidemiological data provided with a breakdown by age of injured people.

Like all good public health practice, this includes a focus on two topics: epidemiology (incidence of injuries, for example, in the population) and etiology (causes of, and contributing factors to, injuries—our focus here). Etiology is substantially linked to the ergonomics involved in bathing, showering and the injury incidents associated with each due to two major factors, points of control and underfoot conditions.

This latter topic, *underfoot conditions*, is beyond the scope of the this proposal and, moreover, is currently most effectively addressed with non-IBC interventions, partly because the plumbing industry is even less well equipped, technologically, to address underfoot conditions, including slipping within, and in the vicinity of, bathtubs and showers.

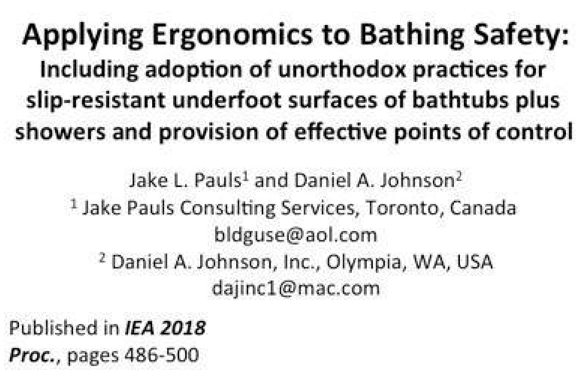
Beyond the scope of this IBC change proposal are non-code solutions for solving the slipping problem at extremely modest cost and bather effort; this involves having a wet terry cloth towel between a bather's feet and the bathtub or shower's underfoot surface. This works more reliably than does almost any attempt to have an inherent slip-resistant surface manufactured into the underfoot bathtub or shower surface for which, the proponents extensive worldwide travels are very, very rarely found, for example, in hotel guest room bathrooms. If hotel operators, who are relatively risk conscious, cannot reliably provide slip-resistant bathing surfaces, what can we expect of ordinary residential occupants or building officials, very few of whom are sufficiently expert on slip resistance.

See the fourth framed figure, a table with fine-grained analysis, of CPSC/NEISS data for a 4-year period, by the Pacific Institute for Research and Evaluation, PIRE, reproduced below—as part of a set of 13 selected slides from the proponent's presentation at a world congress on ergonomics in 2018. This is very relevant to the issue of scoping of these proposed IBC requirements.

In relation to the 2018 presentation, solutions to the ergonomics challenges of bathing and showering safety were addressed by the proponent in a 2018 publication as well as the related presentation delivered at the (latest) 20th Triennial Congress of the International Ergonomics Association which are provided, to the extent possible this proposal. The citation to the formally published paper is:

Pauls, J. and Johnson, D.A. (2018). **Applying Ergonomics to Bathing Safety: Including adoption of unorthodox practices for slip-resistant underfoot surfaces of bathtubs plus showers and provision of effective points of control.** *Proceedings of the 20th Congress of the International Ergonomics Association (IEA2018),* Vol II, Springer, pp. 486-500.

To provide an overview of this scientific paper and full presentation on the ergonomics and epidemiology of the problem this proposal addresses, here follow 13 of the proposal-relevant slides from the 26 PowerPoint slides used in the formal presentation by the lead author (the proponent of this proposal) in Florence, Italy, in 2018. The full presentation can be delivered, at no cost, to any ICC Chapter in a one-hour Webinar by contacting Jake Pauls at bldguse@aol.com. Here follows a selection of the slides from 2018 to introduce the very large background for the full proposal. Presenting them here provides better readability for this proposal.



1. **Introduction to Epidemiology, Etiology and Economics of the Problem**

. . . . Falls are a typical mechanism leading to injuries, many of which occurred with bather movement before, during and after bathing when combinations of four key dangers are present:

- Geometry of the impediments over which one must transfer (e.g., bathtub walls and high sills for dedicated showers)
- Hard, unforgiving surfaces
- Insufficient, effective points of control
- Slippery underfoot surfaces.

Showers & Tubs More Dangerous than Stairs per Unit of Exposure

. . . . A single step into or out of a bathtub imposes a higher risk of a misstep and fall than occurs in a person's typical single step on stair flight—which entails moving ones foot the height of two risers. Each entails traversing about 400 mm vertically. . . .

Growth of bathing-related falls versus those associated with stairs.

Bath and shower-related injuries in the US grew in the two decades between 1991 and 2010 by a factor of two for those resulting in an ED visit and by a factor of three for those resulting in hospital admission after first going to the ED.

For 2010, in the USA, there were about 263,000 ED-treated injuries associated with bathtubs and showers and about one million treated by medical personnel in all settings. . . . Toilet use involves some similar transfer issues to bathing with comparable mitigation measures, namely improving points of control. . . . Vulnerability of older adults [with their non-voluntary exposure] leads to larger proportions of older person injuries from toilet use [relative to use of bathtubs or stairs].

PIRE-calculated annual injuries in USA (2010-14) by treatment type and age

Bathtubs and Showers

			Hospital-admitted			
Age	Doc/Outp	ED	via ED	Direct	Total	%
00-09	37,421.8	43,503.5	1,167.9	620.3	82,713.5	14
10-19	35,732.0	23,165.9	449.5	164.8	59,512.1	
20-29	70,160.9	36,019.2	1,196.7	438.5	107,815.2	59
30-39	111,471.0	36,842.1	1,355.1	394.4	150,062.6	
40-49	128,771.0	37,902.7	2,180.3	666.2	169,520.2	
50-59	123,201.0	38,110.5	3,513.7	1,235.5	166,060.7	
60-69	70,778.2	24,719.1	4,742.3	1,571.3	101,811.0	28
70-79	50,653.0	18,959.1	5,648.5	1,762.5	77,023.1	
>=80	50,961.4	23,964.3	9,880.1	2,699.0	87,504.8	
Total	679,150.0	283,187.0	30,134.0	9,552.5	1,002,023.5	
%	68	28	3	1		

PIRE-calculated annual injuries in USA
(2010-14) by treatment type and age

Toilets

			Hospital-admitted			
Age	Doc/Outp	ED	via ED	Direct	Total	
00-09	8,189.7	7,788.1	200.2	79.0	16,257.0	
10-19	3,013.0	2,532.5	84.2	24.4	5,654.0	7
20-29	7,713.5	5,373.5	250.0	125.0	13,461.9	
30-39	15,319.0	5,987.9	459.1	125.2	21,891.2	
40-49	19,713.9	6,995.6	1,055.7	391.1	28,156.3	34
50-59	26,914.0	9,408.3	2,112.3	673.5	39,108.2	
60-69	30,101.1	10,529.7	3,840.1	1,318.7	45,789.6	
70-79	28,111.9	10,741.6	5,512.9	1,751.8	46,118.2	58
>=80	44,531.3	21,436.1	12,449.2	3,353.6	81,770.2	
Total	183,607.0	80,793.3	25,963.8	7,842.2	298,206.3	
%	62	27	9	3		

2 Practice Innovations Addressing 3 of the 4 Types of Dangers

2.1 Points of Control to Mitigate Transfers over Impediments

Points of control, usable simultaneously by one or both bather's hands, augment the limited and bare feet which are vulnerable to various missteps entering/using/exiting the bathtub or shower.

The costs of installing the two points of control (horizontal or diagonal and vertical) are comparable to the average USD280 societal cost of bathing and toileting-related injuries—expressed on an average, per-household basis—over a one-year period.

The economic bottom line: there is a close match in the annual societal cost-per household, of bathing and toileting-related fall injuries in the US and the cost of installing points of control, such as conventional grab bars and, as a cost-effective, more versatile innovation—*stanchions* (which are very common in buses, street cars and train cars).

See Figure 1 for both options shown simultaneously.

2.2 Hard, Unforgiving Surfaces, Including Those of Impediments

. . . . Dangers are geometry of the impediments one must traverse by stepping over (e.g., bathtub walls and high sills for shower enclosures) and hard, unforgiving surfaces (e.g., enamel surfaces of rigid tub walls, ceramic tiles on walls and floors, and metal water controls plus spouts).

Showers require careful attention to underfoot slip resistance that is often inherent in wet conditions, even with certain tiles and surface roughness treatments underfoot. . . . Unfortunately, for conventional bathtubs with their smooth surfaces, another approach to slip resistance is needed and this is the largest focus of this paper, especially as the recommended intervention is somewhat unorthodox, even heretical to some objecting to a virtually no-cost, simple solution to a complex problem.

3. Provision of Effective Underfoot Slip Resistance

3.1 Recent and Current Safety Standard Situation

Efforts to deal with slippery underfoot surfaces of bathtubs with manufactured surface treatments have not been successful. . . .

Testing Slip Resistance of Terry Cloth Towels with a Tribometer.

The second author of this paper, who is certified in the use of a tribometer (the *Variable Incident Tribometer, VIT*) has, independently been testing comparable terry cloth towel samples with a smooth granite surface as well as a calibrated test tile of known slip resistance (SR) comparable to what a glazed enamel tub provides under dry, damp and sopping wet conditions.

4. Conclusions

Generally, the practice of using ordinary terry cloth towels to solve one of the main problems with bathing safety, along with installation of effective points of control—for example, using stanchions that integrate well with bathroom décor at low cost—should make bathing a less dangerous activity, at modest cost and low installation complexity in both new bathrooms and existing ones.

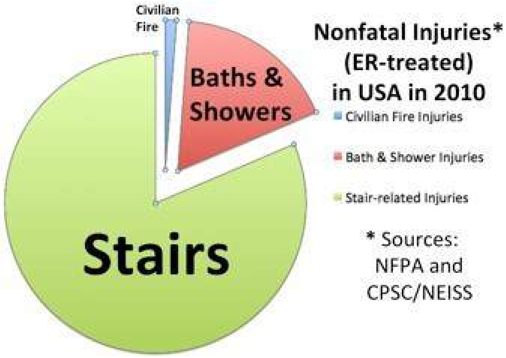
One bottom line is somewhat unorthodox, even heretical. Whereas in much of the work on slip resistance, water is considered an "enemy," it turns out that for slip resistance of smooth, wet surfaces typically found underfoot in a bathtub or shower, the combination of ordinary terry cloth towels and water is your "friend."

Solutions to the slipping and other problems for bathing—especially showering—can be elegant, counterintuitive, inexpensive and immediately at hand (or should we say also "at foot") in every bathroom. Such solutions are addressed in freely accessible videos and, increasingly, those solutions requiring structurally adequate installation of points of control are being enshrined in North American safety standards and building codes. Thus improved bathing safety could be a success story in applying ergonomics to heretofore inadequately addressed public health problems.

References (20 provided)

See www.bldguse.com for related videos on bathing safety and the IEA2018 Proceedings, Vol 2, for the full, 15-page paper.

This overdue attention to this huge public health and safety problem is, significantly, the longstanding, official public policy position of the American Public Health Association (which the proponent has represented on ICC's Industry Advisory Committee since the late 1990s) and the Canadian Public Health Association. As well as being a longtime member of both Associations, the proponent is also a recipient of both Associations' public service awards for his work on model codes and safety standards committee for decades—now totaling over 280 Committee-years of experience, dating back to the 1970s, he has as a voting member on over a dozen national committees in the US alone. Before moving on scoping to technical requirements, there is one last exhibit, a pie chart showing the relative number of nonfatal injuries associated with bathtubs and showers relative to nonfatal stair-related injuries and nonfatal fire-related injuries.



The vast majority of issues that make up the agendas of ICC code development hearings are not associated with the number of injuries that relate to bathing and showering. This is a major reason for the scoping being broad; the problem is broad and involve over one million injured Americans annually who seek professional medical attention for their bathing and showering-related injuries.

Proposed IBC Technical Requirements for Bathtubs withPoints of Control Utilizing Grab Bars and Stanchions Front or Access Side of the Bathtub. Included within proposed section 1210.3.1, for the access (front) side of bathtubs, are five options, all premised on the assumption that the bathtub will be used for both immersion bathing and showering. The later involves some kind of water spray control barrier between the bathtub and the remainder of the bathroom which (at last in North American bathrooms) is designed to stay relatively dry. This can be as simple as an installed shower curtain rod or track over the tub's access side tub rim and manual sealing of the curtain (hung from the rod or track) before each shower at both the control end wall and the head end wall. Thus, at the end walls, an area several inches wide, horizontally, has to be kept free of wall mounted, conventional grab bars that interfere with such routine, yet critical sealing to capture all the shower spray water in the tub, not on the floor outside the tub. This is addressed in 1012.3.1.1 covering options for vertical grab bar, horizontally located ***inside*** the shower curtain rod or track and enclosure wall end framing area of each end wall. The graphic below shows all eight of the options from which a minimum of two are required by the proposed requirements for bathtubs. The eight options include two (grab bar) locations for each of two end walls plus one stanchion option for the entire length of the access side of the bathtub. The graphic shows such a stanchion option about midway along the bathtub length because that works best for the adjacent toilet for which the stanchion is an aid in stand-to-sit and sit-to-stand transfers. These front of tub access side options are discussed below the graphic.

Note that the figure shows the (50-year old enamel steel) bathtub rim-mounted stanchion is outside of the shower curtain rod by 2 to 3 inches, so that the stanchion interferes in no way with the (not shown) shower curtain. Although the curtain is not a matter for IBC scoping, the installed shower curtain rod or track should be as the location is critical to performance of the bathtub or shower both in terms of water control—which is addressed already in IBC Section 1210—as well as in user safety from falls that IBC Section 1210 must now incorporate. Section 1012.3.1.2, covers the access-side option which is outside the shower curtain rod/track either approximately over the outer edge of the bathtub or within 6 inches (150 mm), horizontally, outside the bathtub footprint. Either a wall-mounted conventional grab bar or a stanchion can be located within this area, up to 6 inches (150 mm) away from the access side tub wall as well as the first two inches over the outer edge of the tub rim. Thus there are five options for a single required grab bar as well as multiple additional options for a vertical stanchion anywhere along the length of the access side tub wall. This provides maximum flexibility with bathroom layouts including double-duty service provided by a floor (or tub rim for steel bathtubs) lower mount-to-ceiling vertical stanchion if there is a toilet adjacent to the bathtub. For some users this stanchion will be the most used of all (eight) options included in the proposal package. Also, demonstrating the flexibility of placement with the access side, vertical stanchion is the figure below which has the rim-mounted stanchion (which could also be floor mounted for the same utility) shifted away from the center of the tub wall to allow a person using a head end, tub seat which means more bathtub rim length needs to be clear so ones legs can be easily lifted over the tub rim and into (or out of) the tub. There is also a wall-mounted grab bar located just outside the head end wall to assist with stand-to-sit and sit-to-stand transfers to/from the tub seat.

Although it would drastically affect the tub seat just described, there is also an option of installing rigid glazed panels, fixed, sliding or, more rarely, hinged to form an access side enclosure for the bathtub and manage the shower water capture. The installation and use of such an enclosure, also involves keeping end wall-mounted grab bars and the end-wall framing for the enclosure separated. This is specified in 1210.3.4.2 Spacing, which is addressed later near the end of the proposed technical requirements, the first group of which follow directly below. **1210.3.1 Grab bar or stanchion at the access side to bathtubs and shower/bathtub combinations.** A grab bar or stanchion shall be provided at the access side to each bathtub and shower/bathtub combination in accordance with Section 1210.3.1.1 or 1210.3.1.2. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **1012.3.1.1 End wall grab bar.** A vertical grab bar on one end wall of the bathtub shall be provided between 9 inches (230 mm) and 12 inches (305 mm) horizontally, inward from the access side of the bathtub. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor. **1012.3.1.2 Bathtub access side, grab bar or stanchion.** A vertical grab bar or a vertical stanchion shall be provided within 2 inches (51 mm) maximum inward, and within 6 inches (152 mm) maximum outward, from the access side of the bathtub. The grab bar or stanchion shall be located 2 inches (51 mm) minimum, horizontally, from the centerline of any shower curtain rod installation. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum above the finished floor. **Back Wall or Non-access Side of the Bathtub.** Shifting attention now to the back wall or non-access side, there are three options there with a few the diagonal grab bar having multiple options with the slope angle permitted to be between 30 and 60 degrees to horizontal which could serve differing statures of users. The back wall options are shown in the graphics below.

1210.3.2 Grab bar and stanchion at the back wall, or non-access side, of bathtubs and shower/bathtub combinations. A grab bar or stanchion shall be provided on the back wall, or non-access side of each bathtub and shower/bathtub combination in accordance with Section 1210.3.2.1 or 1210.3.2.2. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **Exception:** For relatively deep bathtubs, where the required centerline height for the overall or lower end height exceeds 24 inches (610 mm) above the adjacent finished floor elevation, the centerline height shall be permitted to be 3 inches (76 mm) maximum above the bathtub rim height. **1210.3.2.1 Horizontal grab bar or stanchion.** A grab bar 36 inches (910 mm) minimum in length, centered, plus or minus two inches (51 mm), along the length of the bathtub, or a full-length stanchion installed between end walls. Its height above the bathtub rim shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum. **1210.3.2.2 Diagonal grab bar.** A grab bar shall be installed in a diagonal position with its angle, to horizontal, 30 degrees minimum and 60 degrees maximum. The diagonal grab bar shall have the higher end located 12 inches (305 mm) maximum from the control end wall, measured horizontally. The lower end shall be 8 inches (203 mm) minimum and 10 inches (255 mm) maximum above the bathtub rim. It should be clear that the back wall (or non-access side) points of control are mostly intended for use in stand-to-sit and the more difficult to perform (with lower limb weakness and issues with postural hypotension), sit-to-stand transfers. The points of control are less used—with the exception of missteps that lead one to fall during tub entry or egress that might be mitigated with a (desperate) grab for something on the non-access side—for the challenge of stepping over the access side of the tub wall. One increasing situation is larger tubs that can be completely or relatively free-standing with no Immediately adjacent walls on any side of the tub. **Summing Up Bathtub Requirements.** To underline how minimal or flexible this code change proposal is, it only requires two points of control —*out of several options*—for bathtub users to enter and exit a bathtub which can have tub walls to surmount that exceed one foot in height (305 mm) with possibly slippery conditions under the weight-bearing foot. Currently that single point of control, under a person's weight-bearing foot, is all that is provided for bathtubs. This merits repetition: *the IBC currently permits one dubious point of control underfoot with no possibility of a hand providing a point of control because there are no grab bars or stanchions at hand*. **Lessons about "Reinforcement" ("Backing") Instead of Actual Installation of Points of Control.** There are many lessons in this proposal's use of many photos (which are but a tiny part of the proponent's image collection); one that has special relevance to the argument about providing only reinforcement for future grab bar installation and thus rely, into the future, on code rules which have begun to provide for this. However, the dimensions for installing such backing, based on (unlikely to be timely) future grab bar installations, were premised on a different paradigm or set of assumptions, namely to provide for future grab bars that, while perhaps working for non-ambulatory users who were relying upon seated-position-to-seated-position transfers into and out of bathtubs and transfer-type showers. Grab bars installed within the limits of such backing would all ambulatory users. Furthermore, they are often based on horizontal grab bar installations that are not as useful as vertical ones for *ambulatory* transfers over tub rims. Thus, instead of having the option of using conventional wall-mounted (into reinforcement or backing) grab bars for *ambulatory* users, especially taller adults, there will possibly be greater reliance on stanchion solutions which do not rely on cantilevered structures attached to walls (which might or might not have appropriate reinforcement) and needing to sustain loads of up to a few hundred pounds, possibly on screwed in attachments that will have substandard performance, for grab bars, if affected by water issues that are addressed at the end of this Reason statement.

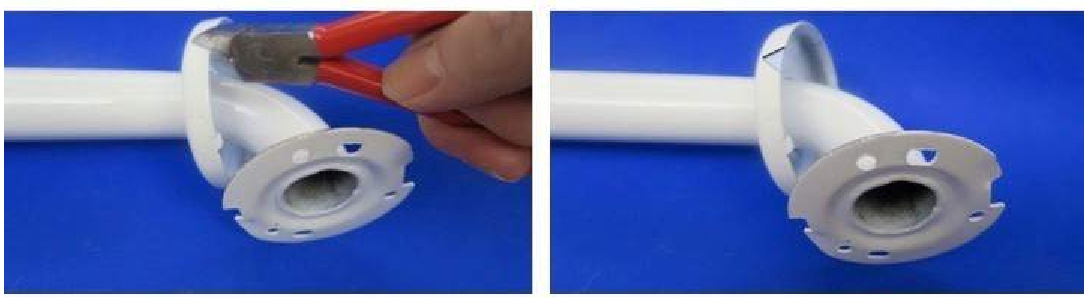
Proposed IBC Technical Requirements for Showers withA Single Point of Control Utilizing a Grab Bar or Stanchion Although stand-alone showers are simpler than are combination bathtubs and showers, they are changing from the conventional small plan area showers to larger plan areas, including retrofit showers where there were formerly bathtubs. Those plan areas were often about 30 by 60 inches (762 by 1524 mm), a retrofit that is increasingly seeing in hotel guest rooms. An example follows of such a conversion before and after the retrofit of a floor-to-ceiling stanchion located at the side of the opening near the edge of the (safety) glass half panel on the access side of the shower. The upper photographs show, on the left side, the poor graspability of the edge of the glass panel, the only thing available as a point of control, albeit a relatively poor one. The lower photographs show the stainless steel stanchion (33 mm diameter) and both hands of a person preparing to exit the shower enclosure

Note that the shower has the controls for the shower water convenient to the entry to the shower enclosure, one of the considerations for such larger showers, especially where the shower head is far away from the entry opening to limit water discharge onto the bathroom floor. The stanchion is located within 36 inches (762 mm), measured horizontally, from both the shower head (which was chosen—in this first proposal—as a reference point for locating the stanchion; another choice—triggered by an amendment to this proposal could reference this to the control or at least one of both). With the lengthened facility, it became clear that a horizontal bar might be more effective than a vertical one, for example to serve bathers needing to take a few steps to get from one end to the other, especially in showers with the (roughly) half-length (safety) glass barrier to help prevent water spray from ending up on the bathroom floor (as illustrated above). There is also (as the ICC ANSI A117 Committee, Accessible Bathing Task Group has started discussing) the problem of where controls for the shower water flow and temperature should be placed, i.e., near the entry end (the situation in the photos above) or at the shower head(s) end. Another consideration, beyond the scope of this code proposal is that, if a point of control for the toilet also becomes important, such a stanchion is also within reach of a person using the toilet.

Thus the stanchion, installed primarily for the shower, also serves stand-to-sit and sit-to-stand transfers associated with the toilet. This option was confirmed by the hotel guest at the time these photographs were taken (as documented in the photograph above). There are also many instances where, depending on the layout of a bathtub (including its controls) and an adjacent shower, a single grab bar or, more likely, a stanchion can serve both bathing/showering facilities. Below is one example (selected from many other bathroom settings in the proponent's photo library of new dwelling unit and hotel guest room bathrooms during the last decade. In this case, this is a hotel guest room which, contrary to the hotel chain's policy, had no grab was provided for either facility. This led to a meeting with the Manager on Duty to complain and point out how easy it would be to retrofit a grab bar or, easier still, a stanchion (similar to the one depicted here which was "installed" digitally). Such a grab bar would comply with both 1210.3.3.1 (for the shower) and 1210.3.1.2 (for the bathtub).

Generally, there is a need for some of the current developments with showers to have the benefit of focused discussions by other experts in both the field of ergonomics as well as the accessibility field. Discussions have already begun with interested members of the previously mentioned A117 Accessible Bathing Task Group who recognize the benefits of what is proposed here for ambulatory users has a benefit for ongoing considerations of bathing and showering facilities for those not capable of ambulation. Some of this rethinking of ICC A117.1 requirements will continue to occur as this proposal goes to the CAH part of the ICC process and as amendments are possible subsequently. With that background to showers, here are the currently proposed requirements for showers as addressed in the IBC. **1210.3.3 Grab bar or stanchion at the access to showers.** A grab bar or stanchion shall be provided for the shower in accordance with Section 1210.3.3.1 or 1210.3.3.2. or 1210.3.3.3. Location dimensions, except as provided for spacing in 1210.3.4.2, are to the centerline of the grab bar or stanchion at the fixed end of its graspable tubing component complying with 1210.3.4.1. **1210.3.3.1 At Shower Exterior.** A vertical grab bar or stanchion shall be provided outside of the shower compartment, adjacent to the access opening. The grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor. **1210.3.3.2 For Smaller Shower Interior.** For showers with interior plan dimensions, including diagonally between corners, 51 inches (1295 mm) maximum, a vertical grab bar shall be provided, interior to the shower compartment, 36 inches (910mm) maximum, measured horizontally from the control wall on the side closest to the access opening. The grab bar shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. **1210.3.3.3 For Larger shower Interior.** For showers with any interior plan dimensions exceeding 51 inches (1295 mm), including diagonally between corners, a grab bar or stanchion located interior to the shower compartment shall be 36 inches (915 mm) maximum, measured horizontally to the access to the shower. If oriented vertically, the grab bar or stanchion shall extend from 24 inches (610 mm) maximum to 60 inches (1524 mm) minimum, measured vertically above the finished floor outside the shower. If oriented horizontally, the grab bar or stanchion shall have a length 36 inches (915 mm) minimum at a height, measured vertically above the finished floor outside the shower, of 48 inches (1220 mm) minimum and 60 inches (1524 mm) maximum. The final section, 12.3.4. deals with mostly well-established details based on the current ICC A117.1 or IBC Section 1210. **1210.3.4 Grab bar and stanchion requirements.** Grab bars and stanchions, shall comply with Section 1210.3.4.1 through 1210.3.4.5. With following requirements almost entirely consistent with the parallel A117.1 requirements, the only reason statement needed is for two matters, both tiny but important details. First, unlike A117.1, the clearance between walls and grab bars is 1.5 inches (38 mm) minimum, not 1.5 inches absolute. The latter is an error in A117.1 that will be corrected, I hope, in the next (2024) edition. The majority of users' hands will slip through a 1.5-inch opening and the danger, when bearing down onto a grab bar, of ones hand slipping into the space and breaking bones in ones forearm is not reduced by the absolute criterion rather than a minimum. See the photos below illustrating how even the hand of a large male, admittedly of advanced age (with some shrinkage of muscle mass),c an slip through a 1.5-inch (38 mm) space. While this results in minor bruising of a very small area of the back of ones hand, there is a benefit to the hand not being jammed in the space as the area of the hand and wrist just above the hand is not an area one wants to injure, as with fracture(s). Having the hand go through the space and then having the arm caught nearer the elbow provides some protection from fracture due to the muscle mass in the upper forearm and the larger bones there.

Bottom line, one does not want to injure ones hand or wrist when “bearing down” on a (horizontal) grab bar with a grab bar that only nominally meets the 1.5-inch (38 mm), absolute spacing rule that must now be reconsidered in A117.1. Hence this draft for mainstreamed grab bars refers to the 1.5 inches as a “minimum” for good reason. **1210.3.4.1 Cross section.** Grab bars and stanchions shall have a cross section complying with one of the following:1. A circular cross section with an outside diameter of 1-1/4 inch (32 mm) minimum and 2 inches (51 mm) maximum.2. A noncircular cross section complying with ICC A117.1. **1210.3.4.2 Spacing.** The space between a grab bar or stanchion and any adjacent wall surface, shall be 1-1/2 inches (38 mm) minimum. **1210.3.4.3 Surface Hazards.** Grab bars or stanchions and adjacent surfaces shall be free of sharp or abrasive elements. Edges shall be rounded. **1210.3.4.4 Structural Characteristics.** Grab bars and stanchions shall be designed and constructed for the structural loading conditions set forth in Section 1607.8.2. **1210.3.4.5 Moisture.** G rab bars and stanchions, including mountings, shall be installed and sealed, or provided with permanent drainage (such as weep holes) for components subject to water intrusion, to protect structural elements from moisture. Aside from the clearance space issue in 1210.3.4, the other new detail is in the existing requirements in IBC 1210 with the addition of the “drainage” detail (in 1210.3.4.5 Moisture) which deals with a common problem with many conventional grab bars which trap water in the bottom third or so of the snap on caps over the fixing plates for screws into the wall. Water flowing along the grab bar can readily enter the void behind the caps and be trapped there indefinitely causing corrosion of the screws and deterioration of the wall materials resulting failure of the screws, especially to pull out forces on the grab bar. Sealing does not solve this problem. Drainage through weep holes or even prying the bottom of the cap away from the wall can mitigate this water entry/accumulation issue. (The latter solution is one the proponent practices in many of the hotels in which he is a guest and an investigator of water deterioration of conventional grab bar fixing systems. This is after describing the problem, among others, to the highest management leaders of the very large hotel chain for which he is a “Titanium” member.) A simple procedure for some minor “surgery” on the offending grab bar caps is illustrated below. Simple cut out a small triangle of the cap edge so water can escape after it (invariably) gets inside the cap by flowing through the typically oversized hole in the cap where the tubing passes through. The full justification (to be provided separately as it is largely consistent with what was submitted in the prior cycle.) will show what can collect and grow behind such caps. Below is shown the readily available tool for creating a permanent drainage hole in the relatively thin metal sheet material formed into the cap shape. The last photo depicts the “V” notch which should be on the bottom edge of the cap when it is installed.



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Approximately 50 internationally-produced scientific and technical references, on bathing/showering safety, were compiled by the proponent, in 2016, for an American Public Health Association (APHA) draft policy highlighting, especially two Canadian research studies that also are addressed in video presentations by Principal Investigators (Dr. Nancy Edwards, Dr. Alison Novak) for the research and posted, for free streaming viewing at, https://vimeo.com/164239941 Accessed January 8, 2018. Additional videos covering technical aspects of bathing and showering safety (including cost impact and benefit issues*) are found at the following links (all of which are available, with descriptions, at www.bldguse.com, the proponent’s Professional Practice Website, Accessed January 8, 2018.).

https://vimeo.com/237294479

https://vimeo.com/239276202 *

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Cost Impact: The code change proposal will increase the cost of construction
This proposal, if adopted, will increase the cost of construction but the payback period is only a few years.

The order of magnitude of such increase, covering two full, three-piece bathrooms with one bathing facility in each, is on the order of a hundred dollars, more specifically in the low hundreds, e.g., 300 to 400 per one-family dwelling and half as much for apartments, hotel rooms, etc. Against these additional costs, which should be amortized over approximately a 15-year period (if not longer), the societal injury costs averted annually are approximately $150, per family, with a break-even point reached in a few years.

On a societal scale, in the USA, the estimated annual number of injuries nearly a decade ago led to over one million professional medical visits (second only to stairs at over four million such visits annually in the USA). About 90 percent of the injuries occur in residential settings, but the breakdown of injury occurrences, for ICC occupancy groupings of R1, R2, R3 and R4, is not available. (More-detailed information can be seen in a more authoritative form in the video of world injury economics expert, Dr. Ted Miller, from Maryland, presenting at the World Public Health Congress in Melbourne, in 2017. This is available on a video streaming freely at https://vimeo.com/channels/866600/239276202).

The injury reduction benefits assumed in this analysis do not cover the much larger daily benefits of enhanced usability and ability to have, for example, a daily shower, which increases in value with the user's age. For example, at 78, proponent Jake Pauls values the daily "hedonistic" benefit (a standard term used in cost-benefit analysis) of each morning shower—facilitated with a single stanchion—at about a dollar per day or $365 per year. The stanchion parts cost only about $40 and DIY installation took about an hour. My total benefit per year, not even assuming any injury averted, exceeds my costs.

The COVID epidemic has likely increased the injury toll, perhaps also the need for therapeutic baths and showers, as it has also greatly increased home usage by all family members. It has also complicated, immensely, the availability of consultations with medical professionals with resulting increase in fall consequences, e.g., leading to physical disabilities. Reduced mobility also increases balance issues and falls generally in the entire population. It will be years before we have authoritative studies and impact analyses on what has happened in 2020 due to the pandemic which is expected to continue well into 2021.

G172-21

G173-21

IBC: 1201.1, 1211 (New), 1211.1 (New), UL Chapter 35 (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

SECTION 1211 UV GERMICIDAL IRRADIATION SYSTEMS.

1211.1 General. . Where ultraviolet (UV) germicidal irradiation systems are provided they shall be *listed* and *labeled* in accordance with UL 8802 and installed in accordance with their listing and the manufacturer's instruction.

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials , ~~and~~ rodentproofing and UV germicidal irradiation systems associated with the interior spaces of buildings.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 8802-2020: Outline of Investigation for Germicidal Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 8802-2020, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Staff Note: G173-21 and G174-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The use of ultraviolet (UV) light solutions for sanitization and germicidal purposes have increased in order to combat COVID-19. UVC exposure poses serious safety risks to skin and eyes. UL developed UL 8802 to address the evaluation of these devices in order to provide minimum safety requirements intended to minimize risks.
The requirements in UL 8802 apply to germicidal systems intended to expose surfaces within an unoccupied area with ultraviolet (UV) energy where the exposure dose would otherwise pose a risk of personal injury to occupants. System components include UV emitters, switches, sensors and other controls acting as site or equipment safeguards. These requirements only address permanently mounted (i.e. fixed) equipment intended to be installed and operated in non-residential locations. The installation and operating instructions are considered an integral system component. A system may also include devices that produce visible light.

Cost Impact: The code change proposal will increase the cost of construction
This proposal has the potential to increase construction costs compared to the installation of non-listed UV germicidal irradiation systems that have not been investigated for safety by an approved certification organization.

G173-21

G174-21

IBC: 202 (New), 1201.1, 1210.4 (New), SECTION 1211 (New), 1211.1 (New), 1211.2 (New), 1211.3 (New), 1211.3.1 (New), 1211.3.2 (New), 1211.4 (New), 1211.5 (New)

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

2021 International Building Code

Add new definition as follows:

GERMICIDAL IRRADIATION. The use of radiant energy to inactivate bacteria, mold spores, fungi, or viruses.

UPPER-ROOM AIR. The air in the room located above the occupied portion of the room that is subject to ultraviolet germicidal irradiation.

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials , ~~and~~ rodentproofing , and *germicidal irradiation* associated with the interior spaces of buildings.

Add new text as follows:

1210.4 Required disinfection. *Germicidal irradiation* for disinfection shall be provided in employee and public toilet facilities in accordance with Section 1211.

SECTION 1211 GERMICIDAL IRRADIATION.

1211.1 General. The provisions of this section shall specify where *germicidal irradiation* for disinfection is required and shall apply to the design, installation, and operation of *germicidal irradiation* luminaires.

1211.2 Required spaces. *Germicidal irradiation* for room disinfection shall be required in the following locations:

1. For all occupancies: employee and public toilet facilities.
2. For Group A-1 occupancies with multiple daily performances.
3. For Group A-2 occupancies.
4. For Group A-3 occupancies in buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
5. For Group B occupancies.
   5.1. Where patient care is rendered.
   5.2. In buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
6. For Group E and I-4 Occupancies.
   Exception: Within dwelling units.
7. For common areas in Group I-1, I-2 and I-3 occupancies in buildings, or portions thereof, with occupant load factor of 15 square feet per occupant or less.
8. For common areas in Group R-1, R-2 and R-4 with an occupant load of 50 or more.

1211.3 Installation requirements. Luminaires and systems shall be installed in accordance with Section 1211.3.1 and 1211.3.2.

1211.3.1 Safe Installation. *Germicidal irradiation* luminaires and systems shall be listed and installed in accordance with Chapter 27, and manufacturer installation instructions, design requirements, and equipment markings. Consideration shall include suitability for occupied or unoccupied locations.

1211.3.2 Mounting conditions. Luminaires for *germicidal irradiation* for *upper-room air* disinfection shall be mounted at the height specified in the manufacturer installation instructions, equipment markings and product listings.

1211.4 Ventilation requirements for germicidal irradiation for upper-room air disinfection. Ventilation for the building shall be provided in accordance with Section 1202. Additional air-mixing may be required for effective germicidal irradiation for upper-room air disinfection.

1211.5 General lighting. Luminaires that emit *germicidal irradiation* shall be permitted to be installed as lighting for general illumination only where permitted by the product listing and indicated in the manufacturer installation instructions.

Staff Note: G173-21 and G174-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: This code proposal will:

1. Increase building occupant health and safety from pathogens
2. Address safe installation and use in building spaces
3. Provide application flexibility for building design practitioners
4. Maintain simple enforceability for code officials

This proposal introduces provisions for building and building room disinfection through germicidal irradiation, which is not currently in the International Building Code. Current attention to healthy and well building environments, along with public health concerns of transmitted diseases, necessitates the IBC's need for germicidal irradiation.

Germicidal irradiation delivers the ability to inactivate human pathogens such as germs, fungi, mold spores, bacteria, viruses, harmful to humans. Various germicidal irradiation technologies have been available and used successfully in buildings for decades. Buildings such as hospitals, restaurants and grocery stores, commonly use germicidal irradiation as a disinfection process, reducing the risk of pathogen and disease spread in and from these environments. Examples of some germicidal irradiation techniques are upper air ultra-violet and air duct ultra-violet irradiation.

This code proposal ensures proper and safe installation of germicidal irradiation in buildings, while providing building design practitioners flexibility in determination and use of disinfection techniques most appropriate for a building's specific use. Building classifications and spaces required to utilize germicidal irradiation are selected based on criteria including:

- Occupant Load Factor of 15 square feet per occupant, or less
- occupant turn-over
- occupant load of 50 or more for R-1, R-2, and R-4 Classifications
- prevalence of high-touch surfaces
- spaces with immune-compromised occupants
- high pathogen load shed

The Occupant Load Factor of 15 square feet per occupant is selected to identify the spaces that most benefit from germicidal irradiation disinfection due to high occupant density.

This proposal requires that devices be listed and identified for germicidal irradiation, and requires installation adherence with manufacturer's installation instructions, Chapter 27 (NFPA-70), product listings and equipment markings. This ensures building occupant safety is maintained by restricting germicidal irradiation exposure to levels deemed acceptable by safety certification agencies.

Many studies and papers are available supporting the effectiveness and safe use of germicidal irradiation techniques in buildings, listed in the following bibliography.

Bibliography: Studies on germicidal irradiation disinfection effectiveness

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Rutala R, Kanamori J, Gergen MF, Sickbert-Bennet EE, Sexton DJ, Anderson DJ, Laux J, Weber DJ (2018) Antimicrobial activity of a continuous visible light disinfection system. Infect. Control & Hosp. Epidem. 39: 1250-1253. https://www.ncbi.nlm.nih.gov/pubmed/30160225

Murrell LJ, Hamilton EK, Johnson HB, Spenser M (2019) Influence of a visible-light continuous environmental disinfection system on microbial contamination and surgical site infections in an orthopedic operating room. Am. J. Infect. Control 47: 804-810. https://www.ajicjournal.org/article/S0196-6553(18)31146-5/pdf

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Takeshita K, Yamanaka H, Sameshima T, et al. Sterilization effect of pulsed light on various microorganisms [J]. Journal of Antibacterial & Antifungal Agents Japan, 2002, 30.

Wang T, MacGregor SJ, Anderson JG., et al. Pulsed ultra-violet inactivation spectrum of Escherichia coli [J]. Water Research, 2005, 39 (13): 2921–2925.

Welch D, Buonanno M, Grilj V, et al. Far-UVC light: A new tool to control the spread of airborne-mediated microbial diseases [J]. Scientific Reports, 2018, 8: 2752, pp 1–7.

Yamano N, Kunisada M, Kaidzu S, et al. Long-term effects of 222 nm ultraviolet radiation C sterilizing lamps on mice susceptible to ultraviolet radiation [J]. Photochemistry and Photobiology, 2020. (open access)

Ushio. White Paper: Care 222® in the workplace: Testing effectiveness of long-range surface infection prevention.

Manuela Buonanno, David Welch, Igor Shuryak & David J. Brenner Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses, Scientific Reports, 2020, 10:10285 | https://doi.org/10.1038/s41598-020-67211-2

Xiong P, Hu J. Inactivation/reactivation of antibiotic-resistant bacteria by a novel UVA/LED/TiO2 system [J]. Water Research, 2013, 47 (13): 4547–4555.

Nunayon S, Zhang H H, Lai A C K. Comparison of disinfection performance of UVC-LED and conventional upper-room UVGI systems [J]. Indoor Air, 2020, 30: 180–191.Mathebula T, Leuschner F W, Chowdhury S P. The Use of UVC-LEDs for the Disinfection of Mycobacterium Tuberculosis [C]// 2018 IEEE PES/IAS PowerAfrica, Cape Town, 2018, pp. 739–744.

Ali S, Yui S, Muzslay M, et al. Comparison of two whole-room ultraviolet irradiation systems for enhanced disinfection of contaminated hospital patient rooms [J]. Journal of Hospital Infection, 2017, 97 (2): 180–184.

Safety Standards and Whitepaper references

IEC 62471:2006 Photobiological safety of lamps and lamp systems

ICNIRP Guidelines On limits of exposure to Ultraviolet radiation of wavelengths between 180 nm and 400 nm (incoherent optical radiation) published in: HEALTH PHYSICS 87(2):171-186; 2004

IEC 62471-2 TR ed 1.0 – Photobiological safety of lamps and lamp systems. Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety

UL 867 – Standard for Safety for Electrostatic Air Cleaners, UL 867

UL 1598/CSA C22.2 No. 250.0 – Standard for Safety for Luminaires

UL/ IEC 61010-1 - Safety requirements for electrical equipment for measurement, control and laboratory use – General Requirements

UL 8750 -Standard for Safety for LED Equipment

UL 8802 Outline of investigation for Germicidal Systems

Global Lighting Association (GLA) Position statement on UV-C Germicidal Irradiation, May 2020, UVC Safety Guidelines

GLA Applications statement on UV-C Germicidal Irradiation, September 2020, Germicidal UV-C irradiation sources, products and applications

Cost Impact: The code change proposal will increase the cost of construction
Benefits noted above are expected to increase the cost of construction by requiring a germicidal irradiation system in the listed occupancies.

G174-21

G175-21 Part I

PART I - IBC: SECTION 202 (New), 2701.1, SECTION 2703 (New), NFPA Chapter 35 (New)
PART II - IFC: SECTION 202 (New), 601.1, SECTION 611 (New)

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

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

2021 International Building Code

Add new definition as follows:

LIGHTNING PROTECTION SYSTEM. A complete system of strike termination devices, conductors which could include conductive structural members, grounding electrodes, interconnecting conductors, surge protection, and other connectors and fittings required to complete the system.

Revise as follows:

2701.1 Scope. The provisions of this chapter and NFPA 70 shall govern the design, construction, erection and installation of the electrical components, appliances, equipment and systems used in buildings and structures covered by this code. The *International Fire Code*, the *International Property Maintenance Code* and NFPA 70 shall govern the use and maintenance of electrical components, appliances, equipment and systems. The *International Existing Building Code* and NFPA 70 shall govern the alteration, repair, relocation, replacement and addition of electrical components, appliances, or equipment and systems.
Lightning protection systems shall comply with Section 2703.

Add new text as follows:

SECTION 2703 LIGHTNING PROTECTION.

2703.1 Lightning Protection. A lightning protection system shall be installed on all new buildings and additions in accordance with NFPA 780.

2703.2 Additions. Where additions are constructed to existing buildings, the existing building's lightning protection system, where present, shall be interconnected and bonded to the new lightning protection system.

2703.3 Surge Protection. Surge protection shall be installed in accordance with NFPA 70 as required by NFPA 780.

> **Exception:** Lightning protection shall not be required for any building or addition where the average lightning flash density is two or fewer flashes per square kilometer per year as indicated in Figure L.2 of NFPA 780 or where determined to be unnecessary by evaluation using the Risk Assessment Guide in NFPA 780 or an alternative method approved by the code official.

Add new standard(s) as follows:

NFPA

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

NFPA 780-20: Standard for the Installation of Lightning Protection Systems

Staff Analysis: UL 780-17 is currently referenced in the 2021 IFC. This is a new edition and a new occurrence of the reference.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Lightning remains the only naturally occurring hazard to buildings and structures that is not addressed or mitigated against in the IBC. The protection against wind, rain, snow, flooding, fire, earthquakes, pests, and other environmental conditions that threaten the safety, public heath, and general welfare of the public have become fundamental requirements of the code. When it comes to one of the most common and costly destructive elements, the current code offers absolutely no protection whatsoever from the negative impacts to a building and structure as a result of lightning. During the five-year-period of 2007-2011, NFPA estimates that U.S. local fire departments responded to an estimated average of 22,600 fires started by lightning per year. These fires caused an estimated average of nine civilian deaths, 53 civilian injuries and $451 million in direct property damage per year. These estimates are based on data from the U.S. Fire Administration (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA) annual fire department experience survey[1]. Lightning-caused fires, structural damage, and other losses are one of the most common troubles faced by American business today. A Carnegie-Mellon study[2] showed that 33% of U.S. businesses are affected by lightning and that more businesses are affected by lightning storms than by floods, fires, explosions, hurricanes, earthquakes, and violence. Insured losses on property in the U.S. can exceed $5 billion dollars annually from lightning alone[3]. According to the Insurance Information Institute, lightning fires in non-residential properties caused an average of $108 million in direct property damage each year from 2007 to 2011. The average annual damage in non-residential properties includes:$28 million in storage facilities, $22 million in places of assembly, such as houses of worship and restaurants, $19 million in nonhome residential properties such as hotels and motels, $15 million in mercantile and business properties such as offices, specialty shops and department stores, $15 million in industrial and manufacturing facilities, $3 million in outside properties, $3 million in educational and healthcare facilities, and $3 million in miscellaneous properties[4]. These stats only take into account the insured losses reported and do not include uninsured losses, lost productivity, lost sales, lost inventory, and other considerable factors. More lightning damage stats can be accessed here: http://lightningsafety.com/nlsi_lls/ListofLosses14.pdf. A copy of the Lightning Protection Institute "Build and Protect: Lightning Protection Frameworks for Resilient Design and Construction" white paper can be downloaded from here: https://lightning.org/wp-content/uploads/2019/11/Build-Protect-White-Paper-2019-1.pdf.

Bibliography: 1. "Lightning fires and lightning strikes", Marty Ahrens, National Fire Protection Association, June 2013, https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Fire-causes/oslightning.pdf

2. "Securing the Supply of Electrical Services," by Jay Apt, Carnegie Mellon University, presented at the Carnegie Mellon Conference on Crisis Readiness, "Before the Next Crisis: Steps to Secure America's Essential Systems," February 28, 2006.

3. Hartford Insurance Group, Sept 14, 2006, http://www.lightningsafety.com/nlsi_lls/ListofLosses14.pdf

4. "Facts + Statistics: Lightning", Insurance Information Group, https://www.iii.org/fact-statistic/facts-statistics-lightning#Lightning%20fires%20in%20residential%20vs.%20non-residential%20properties

Cost Impact: The code change proposal will increase the cost of construction
The average cost of a complete lightning protection system, including deign, materials, installation, and maintenance is approximately 1% to 5% of total construction cost of a building, whereas the average cost to renovate a building with lightning protection after completion of construction is approximately 10 times that of a new building under construction. The cost of the lightning protection system can be off set as much as 80% by insurance premium rate deductions and rebates. Lightning risk assessment calculations are readily available online, for free, and takes approximately 15-25 minutes to complete. A comprehensive lightning protection installation cost study can be reviewed here: https://ecle.biz/coststudy/.

G175-21 Part I

G175-21 Part II

PART II - IFC: SECTION 202 (New), 601.1, SECTION 611 (New)

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

2021 International Fire Code

Add new definition as follows:

LIGHTNING PROTECTION SYSTEM. A complete system of strike termination devices, conductors which could include conductive structural members, grounding electrodes, interconnecting conductors, surge protection, and other connectors and fittings required to complete the system.

Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation and maintenance of the following building services and systems:

1. Electrical systems, equipment and wiring.
2. Information technology server rooms.
3. Elevator systems, emergency operation and recall.
4. Fuel-fired appliances, heating systems, chimneys and fuel oil storage.
5. Commercial cooking equipment and systems.
6. Commercial cooking oil storage.
7. Mechanical refrigeration systems.
8. Hyperbaric facilities.
9. Clothes dryer exhaust systems.
10. Lightning protection systems

Add new text as follows:

SECTION 611 LIGHTNING PROTECTION SYSTEMS.

611.1 Lightning Protection. A lightning protection system shall be installed on all new buildings and additions in accordance with NFPA 780.

611.1.1 Additions. Where additions are constructed to existing buildings, the existing building's lightning protection system, where present, shall be interconnected and bonded to the new lightning protection system.

611.1.2 Surge Protection. Surge protection shall be installed in accordance with NFPA 70 as required by NFPA 780.

Exception: Lightning protection shall not be required for any building or addition where the average lightning flash density is two or fewer flashes per square kilometer per year as indicated in Figure L.2 of NFPA 780 or where determined to be unnecessary by evaluation using the Risk Assessment Guide in NFPA 780 or an alternative method approved by the code official.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: Lightning remains the only naturally occurring hazard to buildings and structures that is not addressed or mitigated against in the IBC. The protection against wind, rain, snow, flooding, fire, earthquakes, pests, and other environmental conditions that threaten the safety, public heath, and general welfare of the public have become fundamental requirements of the code. When it comes to one of the most common and costly destructive elements, the current code offers absolutely no protection whatsoever from the negative impacts to a building and structure as a result of lightning. During the five-year-period of 2007-2011, NFPA estimates that U.S. local fire departments responded to an estimated average of 22,600 fires started by lightning per year. These fires caused an estimated average of nine civilian deaths, 53 civilian injuries and $451 million in direct property damage per year. These estimates are based on data from the U.S. Fire Administration (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association (NFPA) annual fire department experience survey1. Lightning-caused fires, structural damage, and other losses are one of the most common troubles faced by American business today. A Carnegie-Mellon study2 showed that 33% of U.S. businesses are affected by lightning and that more businesses are affected by lightning storms than by floods, fires, explosions, hurricanes, earthquakes, and violence. Insured losses on property in the U.S. can exceed $5 billion dollars annually from lightning alone3. According to the Insurance Information Institute, lightning fires in non-residential properties caused an average of $108 million in direct property damage each year from 2007 to 2011. The average annual damage in non-residential properties includes:$28 million in storage facilities, $22 million in places of assembly, such as houses of worship and restaurants, $19 million in nonhome residential properties such as hotels and motels, $15 million in mercantile and business properties such as offices, specialty shops and department stores, $15 million in industrial and manufacturing facilities, $3 million in outside properties, $3 million in educational and healthcare facilities, and $3 million in miscellaneous properties4. These stats only take into account the insured losses reported and do not include uninsured losses, lost productivity, lost sales, lost inventory, and other considerable factors. More lightning damage stats can be accessed here: http://lightningsafety.com/nlsi_lls/ListofLosses14.pdf. A copy of the Lightning Protection Institute “Build and Protect: Lightning Protection Frameworks for Resilient Design and Construction” white paper can be downloaded from here: https://lightning.org/wp-content/uploads/2019/11/Build-Protect-White-Paper-2019-1.pdf.

Bibliography: 1. “Lightning fires and lightning strikes”, Marty Ahrens, National Fire Protection Association, June 2013, https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Fire-causes/oslightning.pdf
2. "Securing the Supply of Electrical Services," by Jay Apt, Carnegie Mellon University, presented at the Carnegie Mellon Conference on Crisis Readiness, "Before the Next Crisis: Steps to Secure America's Essential Systems," February 28, 2006.

3. Hartford Insurance Group, Sept 14, 2006, http://www.lightningsafety.com/nlsi_lls/ListofLosses14.pdf

4. “Facts + Statistics: Lightning”, Insurance Information Group, https://www.iii.org/fact-statistic/facts-statistics-lightning#Lightning%20fires%20in%20residential%20vs.%20non-residential%20properties

Cost Impact: The code change proposal will increase the cost of construction
The average cost of a complete lightning protection system, including deign, materials, installation, and maintenance is approximately 1% to 5% of total construction cost of a building, whereas the average cost to renovate a building with lightning protection after completion of construction is approximately 10 times that of a new building under construction. The cost of the lightning protection system can be off set as much as 80% by insurance premium rate deductions and rebates. Lightning risk assessment calculations are readily available online, for free, and takes approximately 15-25 minutes to complete. A comprehensive lightning protection installation cost study can be reviewed here: https://ecle.biz/coststudy/.

G175-21 Part II

G176-21

IBC: SECTION 2703 (New), 2703.1 (New), 2703.2 (New), 2703.2.1 (New), 2703.3 (New), UL Chapter 35 (New), NFPA Chapter 35 (New)

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

SECTION 2703 LIGHTNING PROTECTION SYSTEMS.

2703.1 General. Where provided, lightning protection systems shall comply with Sections 2703.2 through 2703.3.

2703.2 Installation. Lightning protection systems shall be installed in accordance with NFPA 780 or UL 96A. UL 96A shall not be utilized for buildings used for the production, handling, or storage of ammunition, explosives, flammable liquids or gases, and other explosive ingredients including dust.

2703.2.1 Surge protection. Where lightning protection systems are installed, surge protective devices shall also be installed in accordance with NFPA 70 and either NFPA 780 or UL 96A, as applicable.

2703.3 Interconnection of systems. All lightning protection systems on a building or structure shall be interconnected in accordance with NFPA 780 or UL 96A, as applicable.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062

UL 96A-2016: Standard for Installation Requirements for Lightning Protection Systems

NFPA

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

NFPA 780-20: Standard for the Installation of Lightning Protection Systems

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 96A-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021. UL 780-17 is currently referenced in the 2021 IFC. This is a new edition and a new occurrence of the reference.

Staff Note: G175-21 and G176-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement:

- Requirements pertaining to Lightning Protection Systems are **not** currently found within the building code.
- This code change does not require the installation of lighting protection systems, but simply provides guidance to those that are installing lighting protection.
- NFPA 780 and UL 96A are two standards that are widely used within the industry, and are currently used for installations but are not very well known to code officials. These standards are in harmony with the provisions of the National Electrical Code, NFPA 70.
- UL 96A can be used for the installation and inspection of many lightning protection systems but the standard has limitations and these are identified in this proposal.
- This proposal is simply intended to provide the code official with assistance in addressing the installation of these types of systems if they are installed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These standards are already used with installations today so there would not be any change in the cost of construction.

G176-21

G177-21

IBC: 3001.2

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems ~~for the deaf, hard of hearing and speech impaired~~. An emergency elevator ~~two-way~~ communication system shall be provided~~. The system shall provide~~ that includes both visual ~~visible text~~ and audible communication modes ~~that meet all of the following~~ complying with the requirements in ASME A17.1/CSA B44.~~:~~

1. ~~When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.~~
2. ~~Is operational when the elevator is operational.~~
3. ~~Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.~~

Reason Statement: The title was modified because this communication system needs to be useable by all people, not just the deaf, hard of hearing and speech impaired.
Added “elevator” to clarify that this applies to the communication system in the elevator since the title is not part of the requirement.

Deleted “two-way” for consistency with ASME A17.1/CSA B44 language.

The communication system is part of the elevator system requirements and the technical criteria for the communication system is provided in ASME A17.1/B44 Safety Code for Elevators and Escalators. As part of the elevator system, the communication system is inspected by elevator inspectors; therefore, the requirements belong in the elevator code. The requirements as currently written in the IBC are no longer needed because the elevator code contains significantly more detailed requirements to make the system accessible to the deaf, hard of hearing, and speech impaired. This proposal retains the base requirement for the system in the IBC but references the technical requirements in ASME A17.1-2019/CSA B44:19 elevator code which is referenced in IBC Chapter 35. The requirements in ASME A17.1-2019/CSA B44:19 were developed for consistency with the guidelines in the ADA Title III which is the regulation specifically for effective communication with the deaf, hard of hearing and speech impaired.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will neither increase nor decrease the cost of construction because the requirements in the A17.1-2019/CSA B44:19 code already need to be complied with per Section 3001.3 Referenced Standards.

G177-21

G178-21

IBC: 3001.2

Proponents: Andrew Cid, BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING, representing BARRIER FREE SOLUTIONS FOR THE DEAF AND HARD OF HEARING

2021 International Building Code

Revise as follows:

3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. An emergency two-way communication system shall be provided <u>in each elevator car</u>. The system shall provide visible text and audible modes that meet all of the following requirements:

1. When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.
2. Is operational when the elevator is operational.
3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

Reason Statement: This proposal is submitted as there is no new standard published, as of this writing, under the ASME A17.1 in support of IBC 2018 Section 3001.2. This code proposal also provides additional direction and clarification for industry. Underlined wording is added text to capture the intent of the proposal. This proposal clarifies as to what type of feature and assistance is required and shall be provided regards to the utilization of a text-based system (consisting of keyboard, visual indicators and button indicators) by an entrapped Deaf or Hard of Hearing passenger(s). I have been working with a dedicated group of industry professionals who have been working hard to develop an A17.1 standard for Section 3001.2. My participation in these ASME efforts for the past 6 years have been exciting and productive in attempting to improve the standard to include criteria for these systems. However, I will continue working to provide assistance to industry, to Fire/Life Safety and First Responders in their jobs in helping others, and to provide access to 50M Deaf & Hard of Hearing citizens. I hope the IBC committee, industry representatives, and the ICC voters, especially the professional First Responders, agree with this proposal. If approved, this will be effective 2024 and the next A17.1 will hopefully be in place by then to support Section 3001.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification of requirements for elevator cars, and is already required.

G178-21

G179-21

IBC: 3001.2, 3001.3, TABLE 3001.3, 3001.4, 3001.5

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

3001.1 Scope. This chapter governs the design, construction, installation, *alteration* and repair of elevators and conveying systems and their components.

Add new text as follows:

3001.2 Structural Design Considerations. Passenger elevators and escalators exposed to outdoor environments shall comply with Sections 1608, 1609, and 1614.

Revise as follows:

3001.3 ~~3001.5~~ Change in use. A change in use of an elevator from freight to passenger, passenger to freight, or from one freight class to another freight class shall comply with Section 8.7 of ASME A17.1/CSA B44.

3001.4 ~~3001.3~~ Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to the applicable standard specified in Table3001.4 ~~3001.3~~ and ASCE 24 for construction in *flood hazard areas* established in Section 1612.3.

TABLE <u>3001.4</u> ~~3001.3~~
ELEVATORS AND CONVEYING SYSTEMS AND COMPONENTS

TYPE	STANDARD
Automotive lifts	ALI ALCTV
Belt manlifts	ASME A90.1
Conveyors and related equipment	ASME B20.1
Elevators, escalators, dumbwaiters, moving walks, material lifts	ASME A17.1/CSA B44, ASME A17.7/CSA B44.7
Industrial scissor lifts	ANSI MH29.1
Platform lifts, stairway chairlifts, wheelchair lifts	ASME A18.1

<u>3001.5</u> ~~3001.4~~ Accessibility. Passenger elevators required to be accessible or to serve as part of an*accessible* means of egress shall comply with Sections 1009 and 1110.8.

<u>3001.6</u> ~~3001.2~~ Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. An emergency two-way communication system shall be provided. The system shall provide visible text and audible modes that meet all of the following requirements:

1. When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.
2. Is operational when the elevator is operational.
3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

Reason Statement: To ensure outdoor elevator and escalator installations address the appropriate design conditions for the environments they may be exposed to. There have been many cases in south Florida where high wind loads were not considered in the design and installation of outdoors escalators and elevators, since it is not currently addressed. Additionally, in other areas, snow and ice loads should be considered. The reorganization of the section is simply to group like items together.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not change the cost of construction since it is only intended to call attention to existing requirements.

G179-21

G180-21

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

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

2021 International Building Code

SECTION 3002 HOISTWAY ENCLOSURES.

Revise as follows:

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

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

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

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

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

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

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

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

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

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

1. The building is not protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The building contains a Group I-1, Condition 2 occupancy.
3. The building contains a Group I-2 occupancy.
4. The building contains a Group I-3 occupancy.
5. The building is a high rise and the elevator hoistway is more than 75 feet (22 860 mm) in height. The height of the hoistway shall be measured from the *lowest floor* to the highest floor of the floors served by the hoistway.

> **Exceptions:**
>
> 1. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

2. Protection of elevator hoistway ~~door openings~~ doors are ~~is~~ not required at the level(s) of exit discharge, provided that the level(s) of exit discharge is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

3. ~~Enclosed elevator lobbies and protection~~ Protection of elevator hoistway ~~door openings~~ doors are not required on levels where the elevator hoistway door opens to the exterior.

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

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

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

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

Exceptions:

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

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

Example of elevator hoistways that are not in rated enclosures.

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

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

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

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

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

This is a clarification of the terminology for elevator hoistways, and shaft protection and the associated elevator doors and has no changes to the construction.

G180-21

G181-21 Part I

PART I - IBC: 3005.2
PART II - IFC: 604.3.4; IBC:[F] 3003.1.4

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

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

2021 International Building Code

SECTION 3005 MACHINE ROOMS.

Revise as follows:

3005.2 ~~Venting~~ Environment. Elevator machine rooms, machinery spaces that contain the driving machine, and control rooms or spaces that contain the operation or motion controller for elevator operation shall be provided with a natural or mechanical means ~~an independent *ventilation* or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be~~ capable of maintaining temperatures and humidity within the range established for the elevator equipment as provided by the manufacturer.

G181-21 Part I

G181-21 Part II

IFC: 604.3.4; IBC:[F] 3003.1.4

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Fire Code

Revise as follows:

604.3.4 ~~Machine room ventilation~~ Environment. Where standby power is connected to elevators and an environmental control means is provided per Section 3055.2, the ~~machine room ventilation or air conditioning~~ environmental control means shall be connected to the standby power source.

2021 International Building Code

SECTION 3003 EMERGENCY OPERATIONS.

Revise as follows:

[F] 3003.1.4 ~~Venting~~ Environment. Where standby power is connected to elevators~~,~~ and an environmental control means is provided per Section 3005.2, the ~~machine room ventilation or air conditioning~~ environmental control means shall be connected to the standby power source.

Reason Statement: Changed the titles of 3003.1.4 and 3005.2 to use a title consistent with 902.1.3. Clarification of the title to Section 3005 to reflect the content of the section. Modified the language in 3005.2 to reflect and align with the language used in ASME A17.1/CSA B44. Made changes in 3003.1.4 to correlate with the changes to 3005.2. There are cases, where the normal air exchange between the equipment location and building environment will be adequate to maintain the temperature and humidity within the specified range. In other cases, mechanical means would be required to maintain the specified range. The specified range is determined by the elevator equipment manufacturer. See also corresponding proposal for IFC 604.3.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will not change the cost of construction since the changes are better aligning the language and requirements between the IBC and the elevator codes.

G181-21 Part II

G182-21

IBC: 1020.2.1 (IFC[BE] 1020.2.1), 3006.2, 3006.2.1

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

2021 International Building Code

Revise as follows:

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

1. The building is not protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The building contains a Group I-1, Condition 2 occupancy.
3. The building contains a Group I-2 occupancy.
4. The building contains a Group I-3 occupancy.
5. The building is a high rise and the elevator hoistway is more than 75 feet (22 860 mm) in height. The height of the hoistway shall be measured from the *lowest floor* to the highest floor of the floors served by the hoistway.
6. The elevator hoistway door is located in the wall of a corridor required to be fire-resistance rated in accordance with Section 1020.1.

Exceptions:

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

Delete without substitution:

~~**3006.2.1 Rated corridors.** Where *corridors* are required to be fire-resistance rated in accordance with Section 1020.2, elevator hoistway openings shall be protected in accordance with Section 3006.3.~~

Revise as follows:

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

Reason Statement: Elevator doors that open into a rated corridor have to meet both the fire partition and fire barrier requirements. The options for elevator door protection in Section 3006.3 would be a viable option, so Section 3006.2.1 could be moved up as Item 6 in Section 3006.2.
The change to 1020.2.1 is a pointer to both the rated corridor and elevator hoistway door protection requirements.

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

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

G182-21

G183-21 Part I

PART I- IBC: SECTION 3006, 3006.3, 3007.6.2, 3007.6.3, 3008.6.1, 3008.6.2, 3008.6.3, 3008.6.3.1, 3008.6.3.2
PART II - IBC: 708.4.1 (New), 709.4.2, 710.4.1 (New)

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

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

2021 International Building Code

Revise as follows:

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

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

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

SECTION 3007 FIRE SERVICE ACCESS ELEVATOR.

Revise as follows:

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

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

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

SECTION 3008 OCCUPANT EVACUATION ELEVATORS.

Revise as follows:

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

Exceptions:

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

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

3008.6.3.

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

3008.6.3 Elevator lobby ~~Lobby~~ doorways. Other than the doors to ~~the hoistway,~~ elevator machine rooms, machinery spaces, control rooms and control spaces ~~within the lobby enclosure~~ in the *smoke barrier*, each doorway to an occupant evacuation elevator lobby shall be provided with a $^3/_4$-hour *fire door assembly* complying with Section 716. ~~The~~ Such *fire door assembly* shall comply with the smoke and draft control assembly requirements of Section 716.2.2.1.1 and be tested in accordance with UL 1784 without an artificial bottom seal.

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

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

G183-21 Part I

G183-21 Part II

PART II - IBC: 708.4.1 (New), 709.4.2, 710.4.1 (New)

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

2021 International Building Code

SECTION 708 FIRE PARTITIONS.

Add new text as follows:

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

SECTION 709 SMOKE BARRIERS.

Revise as follows:

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

SECTION 710 SMOKE PARTITIONS.

Add new text as follows:

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

Reason Statement: The intent of this proposal is to clarify lobby protection requirements – which walls are fire barriers, fire partitions or smoke barriers. This will also clarify what requirements are applicable for the elevator hoistway doors vs. the doors in the other walls of the lobby protection. The current language is inconsistent for the locations where elevator lobbies are specified.This protection of elevator lobbies is a combination of the elevator hoistway and exit stairway (direct access to a stairway is required for fire service an occupant evacuation elevator lobbies) shaft enclosure/fire barriers and the fire partitions or smoke barriers required for lobbies (405.4.3, 3006.3, 3007.6.2 and 3008.6.2) The intent of new 708.4.1 and revised 709.4.2 is to clarify that the fire partitions/smoke barrier criteria is not applicable to all the walls of the elevator lobby since the vertical shaft/fire barrier protections is adequate. Fires typically happen in the occupied portions of the buildings, not within the elevator shaft or the stairway. In addition, in situations where an elevator lobby is provided, the elevator shafts are double protected from smoke intrusion from a fire on the floor.

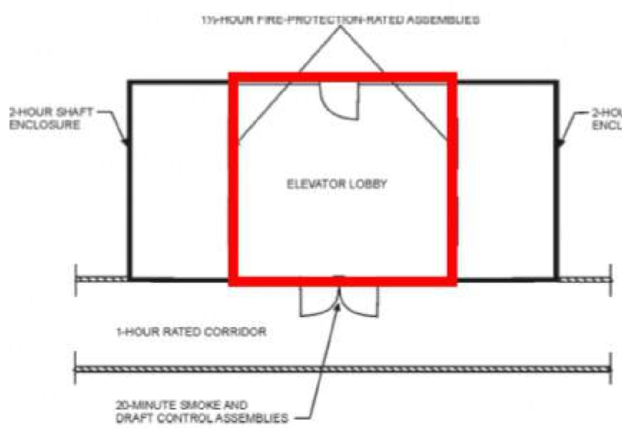

Diagram for elevator lobby

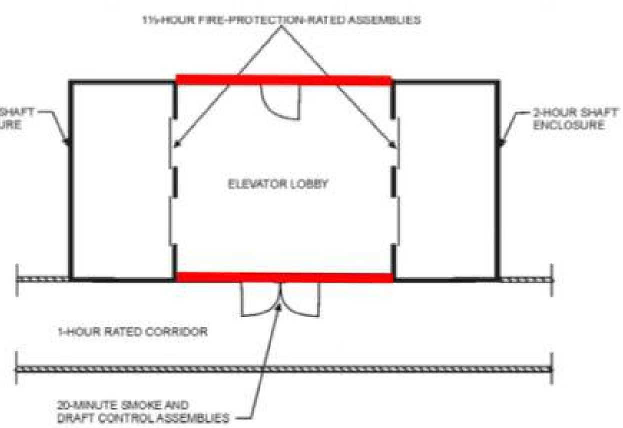

Diagram for which walls are fire partitions, smoke partitions or smoke barriers

Provisions for horizontal continuity are addressed for smoke barriers that surround elevator lobbies or areas of refuge. The same horizontal continuity should be addressed for elevator lobbies enclosed with fire partitions in Section 3006.3 Item 1 or smoke partitions in Section 3006.3 Item 2. The movement of 'smoke barrier wall' just assures a minimum fire resistance rating. The last sentence in 709.4.2 is not needed with the clarification of which walls meet which requirements in Chapter 30.The reference to sprinklers is not needed in Section 3006.3 Item 2, because this is already a limitation in Section 3006.2. Taking it out makes this item easier to read. In addition, this could currently be read to not allow smoke barriers to form elevator lobbies in non-sprinklered buildings. Smoke barriers provide equal or better protection than fire partitions.

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

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

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarification for elevator lobby requirements. While technical criteria was added for horizontal continuity for fire partitions and smoke partitions at elevator lobbies, this was implied previously and does not add cost to construction.

G183-21 Part II

G184-21

IBC: 3006.3

Proponents: Curtis Gonzales, representing Smoke Guard, Inc. (curtis@smokeguard.com); Amanda Hickman, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Revise as follows:

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

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

Reason Statement: Prior to COVID 19 there was concern regarding the safety of the use of shaft pressurization system in hospitals and assisted living facilities. This is not only true in a fire event, but also during testing which could be as frequent as monthly.
Hospitals are designed with spaces that include both positive and negative pressure rooms, both for the safety of occupants and patients. Negative pressure rooms are those with airflow designed to flow into the room, such that infectious agents and pathogens cannot leave that designated space (examples: legionella, tuberculosis, aspergillus, and pseudomonas). Positive pressure rooms are designed such that airflow is out of a room such that it rejects infectious agents such as staff and virus' causing the common cold (example: a burn patient or other immunocompromised patient). Pressurization of an elevator shaft, arguably the dirtiest space in any building, would promote the movement of particles from the elevator shaft into the occupied building volume, greatly increasing the chance of infection.

This would lessen the safety risk in buildings that house the most vulnerable in our population. Now, in the age of COVID-19, we have added another concern to the four primary pathogens.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There are many cost-effective options for protecting the hoistway in Group I-1 or Group I-2. Option 4 is typically the most expensive option so this will not increase the cost of construction.

G184-21

G185-21

IBC: (New), 3006.3

Proponents: Curtis Gonzales, Smoke Guard, Inc., representing Smoke Guard, Inc. (curtis.gonzales@smokeguard.com); Amanda Hickman, representing SmokeGuard, Inc. (amanda@thehickmangroup.com)

2021 International Building Code

Add new definition as follows:

SMOKE PROTECTIVE CURTAIN ASSEMBLY FOR HOISTWAY. An automatic closing smoke and draft control curtain assembly.

Revise as follows:

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

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *fire partitions* in accordance with Section 708. In addition, doors protecting openings in the elevator lobby enclosure walls shall comply with Section 716.2.2.1 as required for *corridor* walls. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway *shaft enclosure* doors from each floor by *smoke partitions* in accordance with Section 710 where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such ~~door~~ doors shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.
5. A *smoke protective curtain assembly for hoistways* shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such curtain assemblies shall comply with the smoke and draft control requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal. Such curtain assemblies shall be equipped with a control unit listed to UL 864. Such curtain assemblies shall comply with section 2.11.6.3 of ASME A17.1/CSA B44. Installation and maintenance shall be in accordance with NFPA 105

Reason Statement: *Smoke protective curtain assemblies for hoistways* are recognized and regulated in NFPA 105 Chapter 9 (2019). There are multiple manufactures of these assemblies in the market. These products have been in the market for 25 years with tens of thousands of successful installations. Smoke protective curtain assemblies provide a proven means for smoke and draft control at the hoistway door that enables design freedom and innovation. Smoke protective curtain assemblies for hoistways should be allowed to provide smoke and draft protection where enclosed elevator lobbies are not required.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of this option for hoistway opening protection is offset by the cost of other forms of protection. As such, the cost of construction for adding option five does not raise or lower the cost of construction.

G185-21

G186-21

IBC: 3006.5 (New)

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

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

2021 International Building Code

Add new text as follows:

3006.5 Two-way communication. Where required by Section 1009.8, a two-way communication system shall be provided at the landing serving each elevator or elevator group.

Reason Statement: Two-way communication is required at the passenger elevators in sprinklered buildings with elevators. This is so that there is a way for people on those floors to communicate when they cannot use the stairways and there is not an area of refuge. This is needed and required even when elevators do not have standby power. The reference in Section 3006.5 is to reinforce this requirement.

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

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

G186-21

G187-21

IBC: 3007.6

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

2021 International Building Code

Revise as follows:

3007.6 Fire service access elevator lobby. The fire service access elevator shall open into an enclosed fire service access elevator lobby in accordance with Sections 3007.6.1 through 3007.6.5. Egress is permitted through the enclosed elevator lobby in accordance with Item 1 of Section 1016.2.

~~Exception~~ Exceptions:

1. Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to be protected in accordance with Section 3006.3.2.
2. A fire service access elevator lobby is not required to be provided at an occupied roof.

Reason Statement: We do not believe that it is necessary to have a fire service access elevator lobby at an occupied roof. There is no purpose for having such an elevator. the purpose of the lobby is to provide a staging area for the fire department to access the floor(s) above. There are no floors above an occupied roof. Therefore, the requirements for the FSAE lobby is unnecessary at that level. This exception maintains the reasonable level of access to the occupied roof, but does not require all of the requirements for the lobby.

Cost Impact: The code change proposal will decrease the cost of construction
Eliminating the requirements for a FSAE lobby at the occupied roof level will reduce the cost of construction.

G187-21

G188-21

IBC: SECTION 3009 (New), 3009.1 (New), 3009.2 (New), 3009.3 (New)

Proponents: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2021 International Building Code

Add new text as follows:

SECTION 3009 PRIVATE RESIDENCE ELEVATORS.

3009.1 General. The design, construction, installation, alteration, repair and maintenance of elevators installed within a residential dwelling unit or installed to provide access to one individual residential dwelling unit shall conform to ASME A17.1/CSA B44, Section 5.3.

3009.2 Hoistway Enclosures. Hoistway enclosures shall comply with ASME A17.1/CSA B44, Requirement 5.3.1.1.

3009.3 Hoistway Opening Protection. Hoistway landing doors for private residence elevators shall comply with ASME A17.1/CSA B44, Requirements 5.3.1.8.1 through 5.3.1.8.3.

Reason Statement: Excessive clearances between the car door and the hoistway door on private residence elevators presents a serious hazard to young children and slight built adolescents or adults. Proper installation of the hoistway landing doors is critical to ensuring the gap between the hoistway door and the car door or gate does not exceed a 4 inch gap. The 4 inch maximum clearance is based on anthropometric data for young children. However, private residence elevators are not inspected by elevator inspectors in most jurisdictions and the few jurisdictions that do inspect them are mostly limited to the installation of new equipment. On the other hand, almost all private residence construction is inspected by construction officials.

The General Contractor typically constructs the hoistway enclosure and installs the hoistway doors on private residence elevators. Ensuring the installation of the hoistway doors so that the clearance between the hoistway door and the landing sill does not exceed the 0.75 inch requirement in ASME A17.1/CSA B44, will greatly increase the likelihood that the clearance between the hoistway and car doors will comply with the 4 inch gap. The proposed language increases awareness for the building designers, contractors and building code officials to the need to mitigate this serious hazard, while retaining the actual code requirements in ASME A17.1/CSA B44.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no additional cost because these requirements are already contained in the A17.1/B44 code referenced in Section 3001.3. This is being added to alert builders to these requirements.

G188-21

G189-21

IBC: 3103.1, 3103.5 (New)

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

2021 International Building Code

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through ~~3103.4~~ 3103.5 shall apply to structures erected for a period of less than 180 days. *Special event structures*, tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall also comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

Add new text as follows:

3103.5 Bleachers. Temporary bleachers,grandstandsandfolding and telescopic seating, that are not building elements, shall comply withICC 300.

Reason Statement: The ICC 300 includes provisions for relocated and temporary bleachers. This information should be included in the IBC Chapter 31 requirements, so it does not get missed for seasonal venues or items such as seating for parades. The definition of 'temporary special event structures' in the IFC says that applies to items not addressed in IBC, so a similar reference in IFC is not needed.
This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is already a reference for ICC 300 in IBC Chapter 10, therefore, this is not a change in requirements.

G189-21

G190-21

IBC: 503.1.2, 3101.1, SECTION 3104 (New), 3104.1 (New), 3104.2 (New), 3104.3 (New)

Proponents: Kyle Parag, representing Division of Fire Prevention & Control (Kyle.Parag@state.co.us)

2021 International Building Code

Revise as follows:

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building where the *building height*, number of *stories* of each building and the aggregate *building area* of the buildings are within the limitations specified in Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each *building*.

Exception: Buildings on the same lot complying with Section 3104.

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, replacement buildings on the same lot, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices,solar energy systems, public use restroom buildings on publicly owned lands in *flood hazard areas* and *intermodal shipping containers*.

Add new text as follows:

SECTION 3104 REPLACEMENT BUILDINGS ON THE SAME LOT.

3104.1 General. The provisions of Sections 3104.2 and 3104.3 shall apply only to structures erected on the same lot as an existing structures to be demolished and the existing buildings.

3104.2 Portions of the same building. The replacement buildings and the existing buildings shall be considered portions of the same building and shall not be limited by Section 506 for the duration of construction, simultaneous occupancy or demolition when in accordance with the following conditions:

1. All associated occupancies are Group A, B, E, F-2, I, R, M, S-2 or U.
2. Replacement building is Type II, III, IV, or V construction.
3. Buildings are simultaneously occupied by the same tenant for a maximum of 180 days.
4. 5 feet (1525 mm) building separation is maintained, measured perpendicular from exterior walls. Projections shall not extend into the minimum distance from either building.
5. The existing buildings will be completely demolished as part of the scope of work for the permit.
6. Permanent buildings will be in compliance with Sections 506 and 705 upon completion of demolition and prior to certificate of occupancy issuance.
7. Project complies with the *International Fire Code*.

3104.3 Means of Egress. Structures shall conform to the *means of egress* requirements of Chapter 10 and Section 3310.

Reason Statement: Replacement buildings are becoming a common occurrence with our building stock aging to a point of non-feasibility of maintenance.

Architects and contractors face countless issues when trying to construct a new building on the same lot as an occupied building.

Locating these buildings on the lot with a reasonable location after the project is complete usually creates conflict in regards to separation distance as sometimes these buildings have to be occupied simultaneously during the transition.

Building officials have the difficult task of requiring either the new building to meet an exterior wall rating, or construction of a temporary fire rated assembly. Either of these options can cost upwards of $100,000 in additional costs to the construction with almost no added life safety benefit.

Attached is an image of such construction, which was completely demolished with the existing school building just a few months later.

This change is designed to allow temporary conditions with limitations.

Change will allow architects to construct buildings with a more logical design for the long term.
180 days was chosen particularly for schools, each semester is designated in a particular location of the campus. 180 days provides just enough time for individual phases to be completed.

Temporary fire wall

Cost Impact: The code change proposal will decrease the cost of construction
A rare occurring issue, with significant cost reduction.

G190-21

G191-21

IBC: 3105.2

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Building Code

Revise as follows:

3105.2 Design and construction. *Awnings* and *canopies* shall be designed and constructed to withstand wind or other lateral *loads* and *live loads* as required by Chapter 16 with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. *Awnings* shall have frames of noncombustible material, *fire-retardant-treated wood*, or heavy timber complying with Section 2304.11~~, or 1-hour construction with combustible or noncombustible covers~~ and shall be either fixed, retractable, folding or collapsible.

Reason Statement: The statement that the awnings or canopies shall be constructed with "combustible or noncombustible materials" is meaningless since there is no other option for a material: it is either combustible or it is noncombustible. The requirement for the frame of an awning to comply with a fire resistance rating (which is what 1-hour construction means) is not an adequate requirement for two reasons. Firstly, fire resistance ratings are intended to assess (as the IBC definition states): "The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703." Secondly, fire resistance ratings are applied to "assemblies of masonry units" and similar assemblies but not to individual materials which are not separating one compartment from another one.
The section contains all the appropriate requirements in terms of structural performance, including the fact that wind and other loads must be able to be withstood.

The awnings being regulated are not separating compartments and, therefore, requiring a fire resistance rating is not appropriate.

Pictures of awnings illustrate the issue:



For information, the first section of the scope of the test used to assess fire resistance ratings (ASTM E119) reads as follows:

1.1 The test methods described in this fire-test-response standard are applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including loadbearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs. They are also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No additional requirements are being added.

G191-21

G192-21

IBC: SECTION 202 (New), 3111.3.5, 3111.3.5.1, 3111.3.5.2 (New)

Proponents: Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

OCCUPIABLE SPACE, EXTERIOR. . An outdoor space designed to allow for human occupancy that is open to the atmosphere and is not subject to smoke accumulation.

PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED. An independent *photovoltaic (PV) panel system* without occupiable space underneath, installed directly on the ground.

PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, OCCUPIABLE. An independent photovoltaic (PV) panel support structure designed with *exterior occupiable space* underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3111 SOLAR ENERGY SYSTEMS.

Add new text as follows:

3111.3.5 Occupiable photovoltaic (PV) support structures. *Occupiable PV support structures* shall comply with either Section 3111.3.5.1 or 3111.3.5.2.

Exception: Occupiable PV support structures that are installed over agricultural use.

3111.3.5.1 PV panels installed over open-grid framing or noncombustible deck. *Occupiable PV support structures* with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, *listed,* and *labeled* with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked "not fire rated" shall not be installed on *occupiable PV support structures.*

3111.3.5.2 PV panels installed over a roof assembly. *Occupiable PV support structures* with a *PV panel system* installed over a *roof assembly* shall have a fire classification in accordance with Section 1505.9.

Revise as follows:

~~3111.3.5~~ 3111.3.6 Ground-mounted photovoltaic (PV) panel systems. Ground-mounted ~~photovoltaic~~*PV panel systems* shall be designed and installed in accordance with Chapter 16 and the *International Fire Code*.

~~3111.3.5.1~~ 3111.3.6.1 Fire separation distances. Ground-mounted~~photovoltaic~~ *PV panel systems* shall be subject to the *fire separation distance* requirements determined by the local jurisdiction.

Staff Note: G192-21 and G193-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary purpose of this proposal is to establish appropriate fire testing and listing criteria for overhead photovoltaic (PV) support structures that could have people or vehicles in the space beneath them. Sometimes referred to as "solar shade structures," they are most commonly constructed over vehicle parking spaces of surface parking lots, are sometimes built on the uppermost level of parking garages, but could be built in a variety of locations with or without cars parked beneath.
Overhead PV structures are referenced in 2021 IBC Section 1607.14.4, and in 2019 California Building Code Section 503.1, but without any definitions.

In 2021 IBC Section 1607.14.4.3, these structures are described as "Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems."

In 2019 California Building Code Section 503.1, Exception 2, these structures are described as: "… solar photovoltaic panels supported by a structure with no use underneath…" In Exception 3, there is a more-specific description by location: "… solar photovoltaic panels supported by a structure over parking stalls …"

Ground-mounted photovoltaic panel systems are referenced in the 2021 I-codes, in IBC Sections 1607.14.4 and 3111.3.5; in IRC Section R324.7; and in IFC Section 1205.5.

For the proposed definition of Occupiable PV Support Structure note the minimum height threshold of 7’-6” is consistent with IBC 1003.2.

Most PV panels in the marketplace have been fire tested and assigned a “type rating” in accordance with UL 1703. However, some PV panels might not have that fire testing, and could be marked “not fire rated.” This proposal clarifies that PV panels marked “not fire rated” cannot be used on occupiable PV support structures that could have people or cars beneath them, with or without a full roof assembly.

Where occupiable PV support structures have PV panels mounted over open-grid framing with no roof deck or sheathing, they cannot achieve a “fire classification” because there is no combustible roof covering to ignite in a UL 2703 spread-of-flame or burning brand test. Therefore, it is sufficient protection to install only type-rated modules. The same is true when PV panels are installed directly over noncombustible metal sheathing without a stand-off mounting system.

Where occupiable PV support structures have a roof assembly and PV panels are rooftop mounted over that roof assembly, then those structures must have a fire classification according to Section 1505.9.

It is important to note the word "occupiable" is used in many locations within the IBC, without an IBC definition. It is also important to note the terms "occupiable" and "occupiable space" are generally understood to have the meaning that humans could be there, but the definition of "occupiable space" in the 2021 IBC is inadequate because it is constrained to "rooms or enclosed spaces." The definition of "occupiable space" is addressed in a separate but related proposal. For purposes of this proposal for "occupiable PV support structures," note the absence of italics for the term "occupiable space" is fully intentional, as these are exterior spaces.

Note in the Preface of the 2021 IBC, in the section titled "Italicized Terms": "Terms italicized in code text, other than document titles, are defined in Chapter 2. The terms selected to be italicized have definitions that the user should read carefully to better understand the code. Where italicized, the Chapter 2 definition applies. If not italicized, common-use definitions apply."

For purposes of this proposal, the term "occupiable space" is not italicized intentionally. There are two reasons for not italicizing this term: to make it independent of the existing definition of "occupiable space" that is "a room or enclosed space," and to make it independent of the separate proposal for a new definition of "exterior occupiable space."

This proposal -- and associated proposals for definitions -- should be helpful to multiple stakeholder groups.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal encourages the use of solar without adversely impacting safety, and clarifies appropriate fire testing for different types of overhead solar installation.

G192-21

G193-21

IBC: SECTION 202 (New), 3111.3.5, 3111.3.5.1, 3111.3.5.2 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new definition as follows:

PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED. . An independent photovoltaic (PV) panel system without useable space underneath, installed directly on the ground.

PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, ELEVATED. . An independent photovoltaic (PV) panel support structure designed with useable space underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

Add new text as follows:

3111.3.5 Elevated photovoltaic (PV) support structures. *Elevated PV support structures* shall comply with either 3111.3.5.1 or 3111.3.5.2.

> **Exception**: *Elevated PV support structures* that are installed over agricultural use.

3111.3.5.1 PV panels installed over open-grid framing or non-combustible deck. *Elevated PV support structures* with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, *listed*, and *labeled* with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked “not fire rated” shall not be installed on *elevated PV support structures*.

3111.3.5.2 PV panels installed over a roof assembly. *Elevated PV support structures* with a PV panel system installed over a roof assembly shall have a fire classification in accordance with Section 1505.9.

Revise as follows:

~~3111.3.5~~ **3111.3.6 Ground-mounted photovoltaic (PV) panel systems.** Ground-mounted photovoltaic panel systems shall be designed and installed in accordance with Chapter 16 and the *International Fire Code*.

~~3111.3.5.1~~ **3111.3.6.1 Fire separation distances.** Ground-mounted photovoltaic panel systems shall be subject to the *fire separation distance* requirements determined by the local jurisdiction.

Staff Note: G192-21 and G193-21 addresses requirements in a different or contradicting manner. The committee is urged to make their intentions clear with their actions on these proposals.

Reason Statement: The primary purpose of this proposal is to establish appropriate fire testing and listing criteria for overhead photovoltaic (PV) support structures that could have people or vehicles in the space beneath them. Sometimes referred to as “solar shade structures,” they are most commonly constructed over vehicle parking spaces of surface parking lots, are sometimes built on the uppermost level of parking garages, but could be built in a variety of locations with or without cars parked beneath.
Overhead PV structures are referenced in 2021 IBC Section 1607.14.4, and in 2019 California Building Code Section 503.1, but without any definitions.

In 2021 IBC Section 1607.14.4.3, these structures are described as “Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems.”

In 2019 California Building Code Section 503.1, Exception 2, these structures are described as: “… solar photovoltaic panels supported by a structure with no use underneath…” In Exception 3, there is a more-specific description by location: “… solar photovoltaic panels supported by a structure over parking stalls …”

Ground-mounted photovoltaic panel systems are referenced in the 2021 I-codes, in IBC Sections 1607.4.4 and 3111.3.5; in IRC Section R324.7; and in IFC Section 1205.5.

For the proposed definition of Elevated PV Support Structure note the minimum height threshold of 7’-6” is consistent with IBC 1003.2.

Most PV panels in the marketplace have been fire tested and assigned a “type rating” in accordance with UL 1703. However, some PV panels might not have that fire testing, and could be marked “not fire rated.” This proposal clarifies that PV panels marked “not fire rated” cannot be used on elevated/overhead PV structures that could have people or cars beneath them, with or without a full roof assembly.

Where elevated PV structures have PV panels mounted over open-grid framing with no roof deck or sheathing cannot achieve a “fire classification” because there is no combustible roof covering to ignite in a UL 2703 spread-of-flame or burning brand test. Therefore, it is sufficient protection to install only type-rated modules. The same is true when PV panels are installed directly over noncombustible metal sheathing without a stand-off mounting system.

Where elevated PV structures have a roof assembly and PV panels are rooftop mounted over that roof assembly, then those structures must have a fire classification according to Section 1505.9.There are several different stakeholder groups that will benefit from this proposal.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It encourages the use of solar without adversely impacting safety.

G193-21

G194-21

IBC: 3101.1, SECTION 3114, 3114.1, 3114.2

Proponents: Gregory Wilson, representing FEMA (gregory.wilson2@fema.dhs.gov); Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

2021 International Building Code

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices, solar energy systems~~, public use restroom buildings on publicly owned lands in~~ ~~*flood hazard areas*~~ and *intermodal shipping containers*.

Delete without substitution:

~~SECTION 3114 PUBLIC USE RESTROOM BUILDINGS IN FLOOD HAZARD AREAS~~.

~~3114.1 General~~. ~~For the purpose of this section, public restroom buildings are located on publicly owned lands in~~ ~~*flood hazard areas*~~ ~~and intended for public use. Public restroom buildings and portions of other buildings that contain public restrooms are limited to toilet rooms, bathrooms, showers and changing rooms. Public restroom buildings and portions of buildings that contain public restrooms shall comply with the requirements of this section. Public-use restrooms that are not elevated or~~ ~~*dry floodproofed*~~ ~~in accordance with Section 1612 shall comply with Section 3114.2. Portions of buildings that include uses other than public-use toilet rooms, bathrooms, showers and changing rooms shall comply with Section 1612.~~

~~3114.2 Flood resistance~~. ~~Public-use restrooms on publicly owned lands in~~ ~~*flood hazard areas*~~ ~~shall comply with the requirements of ASCE 24, except for elevation requirements, and shall comply with all of the following criteria:~~

1. ~~The building footprint is not more than 1,500 square feet (139 m²).~~
2. ~~Located, designed and constructed to resist the effects of~~ ~~*flood*~~ ~~hazards and~~ ~~*flood loads*~~ ~~to minimize~~ ~~*flood*~~ ~~damage from a combination of wind and water~~ ~~*loads*~~ ~~associated with the~~ ~~*base flood.*~~
3. ~~Anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic~~ ~~*loads*~~~~, including the effects of buoyancy during conditions of the~~ ~~*base flood.*~~
4. ~~Constructed of~~ ~~*flood-damage-resistant materials.*~~
5. ~~Where enclosed by walls, the walls have flood openings.~~
6. ~~Mechanical and electrical systems are located above the~~ ~~*base flood elevation.*~~
7. ~~Plumbing fixtures and plumbing connections are located above the~~ ~~*base flood elevation.*~~
8. ~~An emergency plan, approved by the jurisdiction, is submitted to the building official and includes building design documents specifying implementation of protection measures prior to the onset of~~ ~~*flooding*~~ ~~conditions.~~

~~Exceptions:~~

1. ~~Minimum necessary electric equipment required to address health, life safety and electric code requirements is permitted below the~~ ~~*base flood elevation*~~ ~~in accordance with ASCE 24 provisions for electric elements installed below the minimum elevations.~~
2. ~~Plumbing fixtures and connections are permitted below the~~ ~~*base flood elevation*~~ ~~provided that the fixtures and connections are designed and installed to minimize or eliminate infiltration of floodwaters into the sanitary sewage system and discharges from sanitary sewage systems into floodwaters.~~

Reason Statement: Section 3114 was added to the 2021 IBC by code change proposal G149-18. The proponents were Florida Division of Emergency Management and Building Officials Association of Florida. The Florida Building Commission rejected a proposal by the FDEM to include Section 3114 in the process of developing the 7th edition of the Florida Building Code (FBC). Section 553.73 of the Florida Statutes specifies that, at a minimum, the Commission must "adopt any updates to such codes or any other code necessary to maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development." As part of the deliberation of code change proposal G149-18, FEMA submitted a statement explaining the proposal is not consistent with the NFIP and could increase public disaster recovery costs by allowing at-risk public facilities. Because Section 3114 does not meet requirements necessary to maintain NFIP eligibility, the section will not be included in the 7th Edition FBC.
Public use restrooms in flood hazard areas in communities that participate in the NFIP must either meet the elevation requirements of ASCE 24 for Flood Design Class 2 or be dry floodproofed to that same elevation, which is the base flood elevation plus 1 foot. Many coastal communities successfully elevate restrooms in beachfront parks, and many communities elevate or dry floodproof restrooms in public lands along rivers and streams. Of the more than 22,700 communities identified by FEMA as having some degree of flood risk, more than 21,000 elect to participate in the NFIP (as of mid-2019).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal may add to construction costs for some restrooms that might have been designed in accordance with Sec. 3114 depending on height of elevation above the ground, construction of ramps, and/or installation of elevators for ADA compliance. However, this proposal does not change the cost of new public use restrooms in communities that already require them to be elevated or dry floodproofed in accordance with the minimum requirements of the NFIP.

G194-21

G195-21

IBC: SECTION 202 (New), 3101.1, SECTION 3114 (New), 3114.1 (New), 3114.2 (New), 3114.3 (New), 3114.4 (New), 3114.5 (New), 3114.6 (New APPENDIX K, SECTION K107, K107.1, K107.2, K107.3, K107.4

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new definition as follows:

REPORT OF FINDINGS. A report issued by an *approved* agency that provides a technical basis for accepting prefabricated or 3D printed building assemblies. It describes the building assembly construction covered, and provides a summary of the test results, ratings, material properties, and/or material performance characteristics established by evaluation or test.

PREFABRICATED BUILDING ASSEMBLIES. Building assemblies containing electrical, plumbing, HVAC and/or other systems that are assembled in a factory or other manufacturing site, and transported as complete assemblies or sub-assemblies to the construction site where the structure is to be located.

Add new text as follows:

SECTION 3114 PREFABRICATED BUILDING ASSEMBLIES.

3114.1 General. *Prefabricated building assemblies*, where the internal construction, wiring, plumbing, insulation, or other materials cannot be visually inspected at the job site to determine code compliance shall comply with Sections 3114.2 through 3114.7.

> **Exception:** Listed and labeled building assemblies or subassemblies that include prefabricated construction and are installed in accordance with the manufacturer's installation instructions shall not be required to comply with this section.

3114.2 Report of findings. Prior to the approval of *prefabricated building assemblies* and the issuance of a permit, the *building official* shall require the submittal of a report of findings on each *prefabricated building assembly*. It shall include a description of the building assembly, the construction, materials and components included, the basis on which it was evaluated, test results, and other data as necessary for the *building official* to determine conformance to this code.

3114.3 Approved agency. The *report of findings* on the prefabricated building assembly shall be prepared by an *approved* agency.

3114.4 Follow-up inspection. Except where ready access is provided to complete inspection at the site without disassembly or dismantling, ongoing in plant production inspections shall be performed to ensure continued conformance to the approved *report of findings*. The production inspections shall be performed by the *building official* or an independent, *approved* inspection agency at a frequency judged appropriate by the *building official*.

3114.5 Test and inspection records. Required test reports, inspection records and other required records used to develop the *report of findings* shall be made available to the *building official* upon request.

3114.6 Labeling. The *prefabricated building assembly* shall bear a permanently affixed label permanently signifying it complies with all applicable follow-up inspection manual requirements and is covered by an ongoing in-plant audit inspection program. The label shall include the manufacturer's name and address, model number and date of manufacture.

3114.7 Manufacturer's instructions. The *prefabricated building assembly* shall be installed in accordance with the manufacturer's instructions and any limitations described in the *report of findings*.

APPENDIX K
ADMINISTRATIVE PROVISIONS

Delete without substitution:

~~**SECTION K107 PREFABRICATED CONSTRUCTION**~~.

~~**K107.1 Prefabricated construction.** Prefabricated construction is subject to Sections K107.2 through K107.5.~~

~~**K107.2 Evaluation and follow-up inspection services.** Prior to the approval of a prefabricated construction assembly having concealed electrical work and the issuance of an electrical *permit*, the *building official* shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the electrical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the *building official* to determine conformance to this code.~~

~~**K107.3 Evaluation service.** The *building official* shall designate the evaluation service of an *approved* agency as the evaluation agency and review such agency's evaluation report for adequacy and conformance to this code.~~

~~**K107.4 Follow-up inspection.** Except where ready access is provided to electrical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the *building official* shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the *building official* with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.~~

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including *membrane structures*, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices,solar energy systems, public use restroom buildings on publicly owned lands in *flood hazard areas,* <u>prefabricated building assemblies</u> and *intermodal shipping containers*.

Reason Statement: Building assemblies that include factory (in plant) prefabricated construction are being used more frequently in the construction community. These include, but are not limited to modular building units, wall, floor and roof panels, and even completely fabricated bathrooms and kitchens. These assemblies are often craned into place at the job site and connected to the electrical, plumbing and other systems.
This construction practice creates a code compliance challenge because the hidden internal wiring, plumbing, insulation and other internal construction cannot be visually inspected at the job site. This proposal provides a methodology that allows the determination of code compliance with the hidden construction based on an evaluation by an approved agency. As part of the evaluation, the approved agency provides a report of findings on the building assembly that documents the construction provided and the installation methods to be used, along with a summary of the test results, ratings, material properties, and material performance characteristics. This should include all of the information needed by the code official to determine code compliance.

The *Follow-up Inspection* section and *Test and Inspection Records* section are designed to provide the code official assurance that the construction does not vary from what is documented in the report of findings, based on ongoing in-plant audit inspections by an approved inspection agency.

The definition of PREFABRICATED BUILDING ASSEMBLY clearly describes the types of prefabricated building assemblies covered by this section, which are not to be mistaken for other prefabricated products covered by the code, such as cross-laminated timber, engineered wood products, and wood I-joists.

The REPORT OF FINDINGS definition is similar to a definition used in the 2021 IRC for 3D printed building construction, that has been slightly modified to cover this application. The modified new definition for Report on Findings will be submitted to the IRC committee for consistent use of this definition.

Chapter 31 is a logical location for these requirements since it covers “regulations for unique buildings and building elements”. There are similar requirements in the Appendix K107 Administrative Provisions, but they are less detailed and rarely adopted by jurisdictions. Locating these more complete requirements in Chapter 31 provide the code user with a direct path to establishing code compliance.

There are two compliance paths in the proposal, the first being the use of listed building assemblies with prefabricated construction. Because the assemblies are listed there is no need to discuss in-plant follow-up inspections or any of the criteria in 3114.2 through 3114.7, since these are already covered by the listing in-plant follow-up audit inspections. . Examples of listed building assemblies with prefabricated construction are modular booths listed to UL 962 and modular data centers listed to UL 2755.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal clarifies the compliance path that can be used for gaining approval of prefabricated building assemblies, as compared to using alternate materials and methods provisions.

G195-21

G196-21

IBC: 3115.3, 3115.3.2 (New), FIGURE 3115.3.2 (New), 3115.8, 3115.8.1, 3115.8.1.1, 3115.8.2, 3115.8.3, 3115.8.3.4 (New), FIGURE 3115.8.3.4 (New), 3115.8.3.4.1 (New), 3115.8.3.4.2 (New), 3115.8.4.1, 3115.8.4.2, 3115.8.4.3, 3115.8.3.4.1 (New), 3115.8.3.4.2, 3115.8.5, 3115.8.5.1, 3115.8.5.2, 3115.8.5.3, TABLE 3115.8.5.3, ISO Chapter 35

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

2021 International Building Code

Add new text as follows:

3115.3 Intermodal shipping container physical identification. *Intermodal shipping containers* shall have the physical markings and data plate required by Sections 3115.3.1 and 3115.3.2 and verified by an approved agency. A report of the verification process and findings shall be provided to the building owner and building official.

Where approved by the building official, the markings and existing data plate are permitted to be removed from the intermodal shipping containers before they are repurposed for use as buildings or structures or as a part of buildings or structures.

Revise as follows:

~~**3115.3**~~ **3115.3.1 Intermodal shipping container ~~information~~ data plate.** *Intermodal shipping containers* shall bear an existing plate labelled as "CSC SAFETY APPROVAL" in English or French containing the following information. ~~as required by ISO 6346 CSC and verified by an approved agency. A report of the verification process and findings shall be provided to the building owner.~~

1. ~~Manufacturer's name or identification number.~~ Abbreviated country of approval, abbreviated approval agency, and approval agency reference number.
2. Date manufactured.
3. ~~Safety approval number.~~

4.3. Manufacturer's Identification number.

5.4. Maximum operating gross mass ~~or weight~~ (kg) (lbs).

6.5. Allowable stacking load for 1.8G (kg) (lbs).

7.6. Transverse racking test force (Newtons).

8.7. ~~Valid~~ Required maintenance examination date.

~~Where approved by the *building official*, the markings and existing data plate are permitted to be removed from the intermodal shipping containers before they are repurposed for use as buildings or structures or as a part of buildings or structures.~~

Add new text as follows:

3115.3.2 Intermodal shipping container markings. *Intermodal shipping containers* shall have markings, separate from the data plate, containing the following information. Refer to Figure 3115.3.2 for an example layout of the markings.

1. An owner code consisting of three letters.
2. An equipment category identifier that shall be the letter U. This equipment category identifier is grouped with and immediately follows the owner code.
3. A six digit serial number.
4. A check digit in a box.
5. A two digit size code.
6. A type code of two letters. The first letter shall be G, V, U, B, or S. This type code is grouped with and immediately follows the size code.
7. Maximum gross mass (kgs) (lbs).
8. Tare mass (kgs) (lbs).

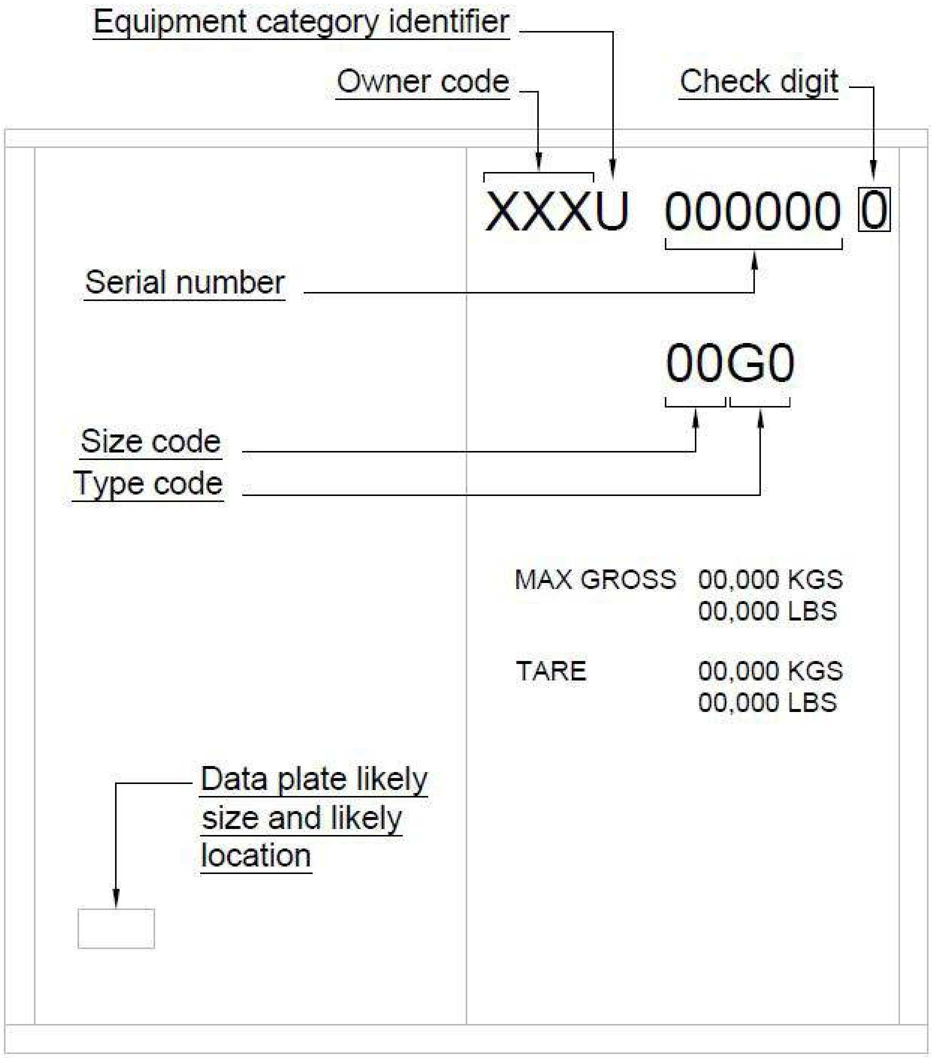

FIGURE 3115.3.2
MARKING IDENTIFICATION AND LIKELY LAYOUT

3115.4 Protection against decay and termites. Wood structural floors of *intermodal shipping containers* shall be protected from decay and termites in accordance with the applicable provisions of Section 2304.12.1.1.

3115.5 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any *intermodal shipping container*, except spaces occupied by basements and cellars, shall be provided with ventilation in accordance with Section 1202.4.

3115.6 Roof assemblies. *Intermodal shipping container* roof assemblies shall comply with the applicable requirements of Chapter 15.

Exception: Single-unit, stand-alone intermodal shipping containers not attached to, or stacked vertically over, other intermodal shipping containers, buildings or structures.

3115.7 Joints and voids. Joints and voids that create concealed spaces between connected or stacked *intermodal shipping containers* at fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint system* in accordance with Section 715.

Revise as follows:

3115.8 Structural. Intermodal shipping containers that conform tointernational standards that test certain structural properties of the containers~~ISO 1496-1~~, as identified by the required markings in Section 3115.3.2, and are repurposed for use as buildings or structures, or as a part of buildings or structures, shall be designed in accordance with Chapter 16 ,and the material specific chapters, ~~and~~ except for the provisions specifically stated in Section 3115.8.1 through 3115.8.4.3 ~~this section~~.

3115.8.1 Foundations and stacking. *Intermodal shipping containers* repurposed for use as a permanent building or structure shall be supported on foundations, other *intermodal shipping containers*, or other supporting structures designed and constructed in accordance with Chapters 16 through 23.

3115.8.1.1 Anchorage. *Intermodal shipping containers* shall be anchored to foundations or other supporting structures as necessary to provide a continuous load path for all applicable design and environmental *loads* in accordance with Chapter 16.

Delete without substitution:

~~**3115.8.2 Welds.** New welds and connections shall be equal to or greater than the original connections.~~

Revise as follows:

~~**3115.8.3**~~ **3115.8.2 Structural design.** The structural design for the *intermodal shipping containers* repurposed for use as a building or structure, or as part of a building or structure, shall comply with Section ~~3115.8.4~~ 3115.8.3 or ~~3115.8.5~~ 3115.8.4.

~~**3115.8.4**~~ **3115.8.3 Detailed design procedure.** A structural analysis meeting the requirements ofChapter 16, the applicable material chapters, and Section 3115.8.3.1 through 3115.8.3.4.2 ~~this section~~ shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Intermodal shipping containers designed in accordance with Section 3115.8.4 ~~3115.8.5.~~

~~**3115.8.4.1**~~ **3115.8.3.1 Steel Material properties.** Structural material properties for existing *intermodal shipping container* steel components shall be established by Section 2202.~~material testing where the steel grade and composition cannot be identified by the manufacturer's designation as to manufacture and mill test.~~

~~**3115.8.4.2**~~ **3115.8.3.2 Seismic design parameters.** The seismic force-resisting system shall be designed and detailed in accordance with one of the following:

1. Where all or portions of the ~~corrugated~~ profiled steel panel container sides are considered to be the vertical seismic force-resisting system, design and detailing shall be in accordance with AISI S100 ~~the~~ and ASCE 7, Table 12.2-1 requirements for ~~light-frame bearing wall systems with shear panels of all other materials.~~ steel systems not specifically detailed for for seismic resistance, excluding cantilever column systems.
2. Where portions of the ~~corrugated~~ profiled steel panel container sides are retained, but are not considered to be the vertical seismic force-resisting system, an independent seismic force-resisting system shall be selected, designed and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where portions of the ~~corrugated~~ profiled steel panel container sides are retained and integrated into a vertical seismic force-resisting system other than as permitted by Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

~~**3115.8.4.3**~~ **3115.8.3.3 Allowable shear value.** The allowable shear values for the*intermodal shipping container* ~~corrugated~~ profiled steel ~~sheet~~ panel side walls and end walls shall be demonstrated by testing and analysis accordance with Section 104.11. Where penetrations are made in the side walls or end walls designated as part of the lateral force-resisting system, the penetrations shall be substantiated by rational analysis.

Exceptions: The allowable shear values shall be obtained from Section 3115.8.4.3 where the seismic design category is A, and the following two items are met:

1. The *intermodal shipping container* top and bottom rails, corner fittings, and columns or any portion thereof are not notched, cut, or removed in any manner.
2. The *intermodal shipping container* is erected in a level and horizontal position with the floor located at the bottom.

Add new text as follows:

3115.8.3.4 Tested structural components. Where they are not altered, the structural components identified in Section 3115.8.3.4.1 and 3115.8.3.4.2 can be used with the load combinations of Section 1605.3 based on the testing performed during the *intermodal shipping container* certification process. This certification shall have been verified by the data plate and markings in Section 3115.3.

The components names are labeled in Figure 3115.8.3.4.

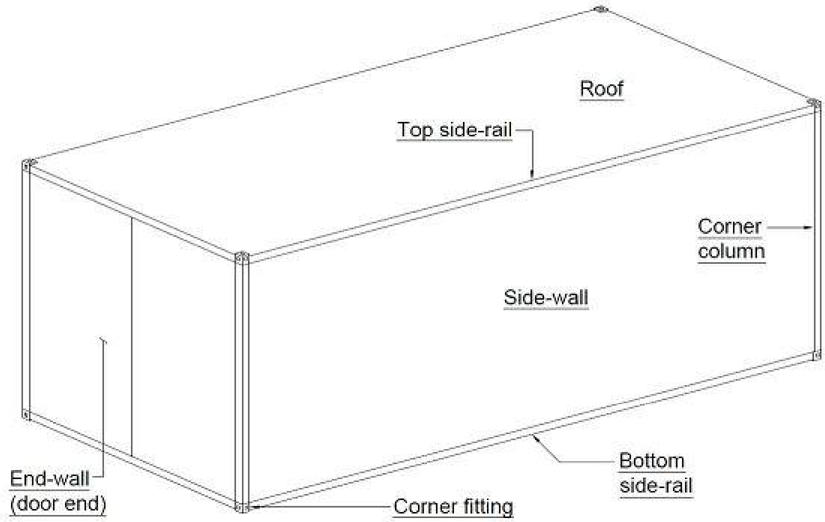

FIGURE 3115.8.3.4
CONTAINER ELEMENT IDENTIFICATION

Revise as follows:

3115.8.3.4.1 Floors. Where the floor is not structurally altered from its state as a shipping container, the allowable superimposed out-of-plane design load for the floor is permitted to be calculated in accordance with Equation 31-1. The design load of the bottom rails to span from corner to corner shall not be obtained using similar methods. The ability for the floors and bottom rails to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

Exceptions:

1. The capacity of the shipping container bottom side rails, in their original vertical orientation, to span from corner to corner under gravity loads can be obtained from Equation 31-2, where the floor, walls directly above, top rail directly above, corner columns, and roof are not structurally altered from their state as a shipping container.
2. The capacity of the shipping container bottom end rails, in their original vertical orientation, to span from corner to corner under gravity loads can be obtained from Equation 31-3, where the floor, walls directly above, top rail directly above, corner columns, and roof are not structurally altered from their state as a shipping container.

$q_a = 0.8(R-T)/(LW)$ **(Equation 31-1)**
where:

q_a = Allowable superimposed design load using ASD load combinations, in lb/ft^2 (kg/m^2)

R = Maximum gross mass, as marked on the container and its CSC Safety Approval Plate, in lbs (kgs)

T = Tare mass, as marked on the container and its CSC Safety Approval Plate, in lbs (kgs)

L = Interior floor length dimension of the shipping container, in feet (meters)

W = interior floor width dimension of the shipping container, in feet (meters)

$w_a = 0.8(R-T)/W$ **(Equation 31-2)**
where:

w_a = Allowable superimposed design load using ASD load combinations, in lb/ft (kg/m)

The other variables are defined as in Equation 31-1.

$w_a = 0.8(R-T)/L$ **(Equation 31-3)**
where:

The variables are defined as in Equation 31-1 and 31-2.

3115.8.3.4.2 Side-wall and end-wall. Where the side-wall is not structurally altered from its state as a shipping container, the allowable out-of-plane design load for the side-wall is permitted to be calculated in accordance with Equation 31-4. The ability for the side-wall to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

Where the end-wall is not structurally altered from its state as a shipping container, the allowable out-of-plane design load for the end-wall is permitted to be calculated in accordance with Equation 31-5. The ability for the end-wall to sustain these out-of-plane loads in combination with other forces shall be determined by the structural analysis.

$q_a = 0.24(R-T)/HL$ **(Equation 31-4)**

where:

H = The interior height dimension of the wall, in feet (meters)

The other variables are defined as in equation 31-1.

$q_a = 0.16(R-T)/HW$ **(Equation 31-5)**

where:

The variables are defined as in Equation 31-1 and 31-4.

3115.8.4 ~~3115.8.5~~ Simplified structural design of single-unit containers. Single-unit*intermodal shipping containers* conforming to the limitations of Section 3115.8.5.1 shall be permitted to be designed in accordance with the simplified structural design provisions of Section 3115.8.5.2.

3115.8.4.1 ~~3115.8.5.1~~ Limitations. The use of Section 3115.8.5 is subject to the following limitations:

1. The *intermodal shipping container* shall be a single-unit, stand-alone unit supported on a foundation and shall not be in contact with or supporting any other shipping container or other structure.
2. The *intermodal shipping container* top and bottom rails, corner castings, and columns or any portion thereof shall not be notched, cut, or removed in any manner.
3. The *intermodal shipping container* shall be erected in a level and horizontal position with the floor located at the bottom.
4. The *intermodal shipping container* shall be located in Seismic Design Category A, B, C or D.

~~3115.8.5.2~~ 3115.8.4.2 Simplified structural design. Where permitted by Section~~3115.8.5.1~~ 3115.8.4.1, single-unit, stand-alone intermodal shipping containers shall be designed using the following assumptions for the ~~corrugated~~ profiled steel panel shear walls:

1. The appropriate detailing requirements contained in Chapters 16 through 23.
2. Response modification coefficient, R = 2.
3. Overstrength factor, $\Omega_0 = 2.5$.
4. Deflection amplification factor, $C_d = 2$.
5. Limits on structural height, $h_n = 9.5$ feet (2900 mm).

~~3115.8.5.3~~ 3115.8.4.3 Allowable shear. The allowable shear for the ~~corrugated~~ profiled steel panel side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section ~~3115.8.5.2~~ 3115.8.4.2 shall be in accordance with Table ~~3115.8.5.3~~ 3115.8.4.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure ~~3115.8.5.3(1)~~ 3115.8.4.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure ~~3115.8.5.3(2)~~ 3115.8.4.3(2) .
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure ~~3115.8.5.3(3)~~ 3115.8.4.3(3).
4. Where openings are made in container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure ~~3115.8.5.3(4)~~ 3115.8.4.3(4).

6. End wall doors designated as part of the lateral force-resisting system shall be welded closed.

TABLE ~~3115.8.5.3~~ 3115.8.4.3
ALLOWABLE SHEAR VALUES FOR INTERMODAL SHIPPING CONTAINER ~~CORRUGATED~~ PROFILED STEEL PANEL WALLS FOR WIND OR SEISMIC LOADING

~~CONTAINER DESIGNATION[b]~~	CONTAINER DIMENSION (nominal length)	~~CONTAINER DIMENSION (nominal height)~~	ALLOWABLE SHEAR VALUES (PLF)~~[a,c]~~	
			Side Wall	End Wall
~~1EEE~~	45 feet	~~9.5 feet~~	75	843
~~1EE~~		~~8.5 feet~~		
~~1AAA~~	40 feet	~~9.5 feet~~	84	
~~1AA~~		~~8.5 feet~~		
~~1A~~		~~8.0 feet~~		
~~1AX~~		~~< 8.0 feet~~		
~~1BBB~~	30 feet	~~9.5 feet~~	112	
~~1BB~~		~~8.5 feet~~		
~~1B~~		~~8.0 feet~~		
~~1BX~~		~~< 8.0 feet~~		
~~1CC~~	20 feet	~~8.5 feet~~	168	
~~1C~~		~~8.0 feet~~		
~~1CX~~		~~< 8.0 feet~~		
~~1D~~	~~10 feet~~	~~8.0 feet~~	~~337~~	
~~1DX~~		~~< 8.0 feet~~		

For SI: 1 foot = 304.8 mm.

a. ~~The allowable strength shear for the side walls and end walls of the intermodal shipping containers are derived from ISO 1496-1 and reduced by a factor of safety of 5.~~

b. ~~Container designation type is derived from ISO 668.~~

c. a. Limitations of Section 3115.8.4.1 ~~3115.8.5.1~~ shall apply.

Delete without substitution:

ISO

International Organization for Standardization
Chemin de Blandonnet 8 CP 401 1214 Vernier
Geneva Switzerland

~~ISO 668—2013: Series 1 Freight Containers—Classifications, Dimensions and Ratings~~

~~ISO 1496-1—2013: Series 1 Freight Containers—Specification and Testing - Part 1: General Cargo Containers for General Purposes~~

~~ISO 6346—1995: Freight Containers—Code, Identification and Marking with Amendment 3 - 2012~~

Reason Statement: Intermodal international shipping containers are primarily governed by two standards that would affect portions of how they behave structurally: The International Maritime Organization's (IMO) International Convention for Safe Containers (CSC) of 1972, amended in 1993, and ISO 1496-1. ISO 6346 contains the marking requirements for containers that meet various ISO standards, including 1496-1.
Re 3115.3: Both CSC and ISO 6346 require different physical identifiable information to be present on the container. The CSC requires the data plate, and ISO 6346 requires much larger markings, that are usually painted on. Both need to be present in order to verify both CSC and 1496-1 have been met.

Re 3115.3.1: This section is adjusted to remove the reference to ISO 6346 for the data plate, which was both incorrect and unnecessary, as the user of the code does not need to actually read CSC or ISO 6346 to verify the items written.

Re 3115.3.2: This section is added such that the requirements that ISO 6346 requires be marked on the containers are verified, and have the correct type code, such that conformance to ISO 1496-1 can be determined by these markings.

Re 3115.8: The reference to ISO 1496-1 is removed, as the user of the code does not need to read ISO 1496-1, as it does not contain information that is used for design in this code. The user is informed that the markings that were required in 3115.3.2 verify that international standards have been met. The inclusion of the material specific chapters, is that many of the components of shipping containers cannot be structurally verified purely by the tests that have been conducted as part of the international certification process, so they would need to be analyzed in accordance with the steel and wood chapters. The final statement is in recognition that Section 3115 is modifying the provisions found elsewhere in the code that, unless specifically stated, would still apply.

Re 3115.8.1: Clarifying that containers can be stacked

Re 3115.8.2: The statement on welds could have multiple interpretations, and doesn't seem to add any value with any of them. It would require welds to be held to some vague and arbitrary standard of equality to existing welds. If this section was intended for weld replacements, or weld fixes, it should be modified as such, but its purpose would still seem dubious. It could also be interpreted that every weld taking place on a container would need to meet this vague equality requirement, which once again doesn't seem to have a purpose.

Re 3115.8.4: The inclusion of the material specific chapters, is that many of the components of shipping containers cannot be structurally verified purely by the tests that have been conducted as part of the international certification process, so they would need to be analyzed in accordance with the steel and wood chapters.

Re 3115.8.4.1: The requirements of Section 2202 already have provisions for identifying unknown steel, and so they should not be recreated or differently stated.

Re 3115.8.4.2: The sides of containers do not meet the definition for *light-frame construction* as used in the IBC or in the AISI standards, so they should not be using light-frame construction methods.They are cold-formed steel profiled panels, as such AISI S100, which invokes AISI S310 for profiled steel panels being used as diaphragms is therefore the correct reference. All of their components are steel, as required by the definition of intermodal shipping containers, so its clearly follows that they are steel systems which have not been detailed for seismic resistance. This would be in line with AISI S310 design methods as invoked by AISI S100.

Re 3115.8.4.3: A name change to be consistent with the AISI standards governing profiled steel deck diaphragm panels, AISI S100 and AISI S310. The exception proposed follows the logic used to justify the floor tested components, as the static racking strength in the longitudinal and transverse directions has been verified by tests in accordance with ISO 1496-1.

Re 3115.8.4.4: As the containers have already undergone certification that involves structural testing they can be trusted for their structural capacity in certain specific ways. The challenge comes with cutting parts out of them, or leaving their doors open, as is done when converting them into buildings. Therefore, the components that can be trusted must only be done so under certain circumstances, as laid out in this section. With some clever deductive reasoning the provisions of this section could potentially be expanded.

Re 3115.8.4.4.1: One of the easiest components of the certified containers to trust based on their testing are the floor members that typically span from side-wall to side-wall. These floors have had two primary tests conducted on them as required by both CSC and ISO 1496-1: Being loaded such that the total mass of the container and its contents reaches two times the maximum gross mass marked on the containers, and having a 16 kip 2 wheeled vehicle driven around inside of them all while only supported from their corner fittings, that project further down than their side rails. As such, equation 31-1 recognizes the tested capacity of the floors, with factors of safety. The value that the floor is required to hold during its tests is 2(R-T). As such the allowance for 0.8(R-T) is using a factor of safety of 2.5, as used for tested components in 1709.3.1. The international standard for serviceability that these containers meet is: no permanent deformation that would render them incapable of being used for their designed purpose, as such factor of safety of 2.5 should suffice for maintaining serviceability under live loading scenarios, even though the containers have never had proper serviceability limit states in accordance with the IBC. The allowance for the bottom side rails to span is similar to the floor members themselves, however the bottom side rails are braced against buckling by the adjacent floors and walls above, so the adjacent members become critical components. The bottom side rails are also aided to a very large extent in their spanning capabilities by acting as deep beams with the walls and top rail above. Therefore, their capacity can only be relied on in the cases where all of their bracing and composite action bestowing components have remained in place.

Re 3115.8.4.4.2: Similar to the floors, the walls of the containers have been tested under the international standards that the containers are certified to. The side walls are tested under a load equal to 0.6 times the mass of the net contents multiplied by the acceleration due to gravity. This is further reduced here by a factor of safety of 2.5.
The end walls are tested under a load equal to 0.4 times the mass of the net contents multiplied by the acceleration due to gravity. This is further reduced here by a factor of safety of 2.5.

Re 3115.8.5.2 and 3115.8.5.3: Simply a name change to be consistent with the AISI standards governing profiled steel deck diaphragm panels, AISI S100 and AISI S310.

Re Table 3115.8.5.3: Containers that are 10 feet long, with designations of 1D or 1DX have not been tested to transverse or longitudinal racking force resistance, in accordance with ISO 1496-1, so they cannot be trusted to have this strength, and are removed from the table. The container designation and container height provide no useful information, and are also removed.

Re ISO Standard 668, 1496-1, and 6346: The code does not require the user to go to these reference standards in order to design a building or structure, as such their inclusion as referenced standards is inconsistent with how the other reference standards are used, where they provide design information to be used in conjunction with the IBC.

Bibliography: CSC (1996), *International Convention for Safe Containers,* CSC, International Maritime Organization, 4 Albert Embanklment, London SE1 7SR, United Kingdom of Great Britain and Northern Ireland.
ISO (2013), *Series 1 freight containers - Specification and testing - Part 1: General cargo containers for general purposes,* ISO 1496-1, International Organization for Standardization, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland

ISO (1995), *Freight containers - Coding, identification and marking,* ISO 6346, International Organization for Standardization, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland

AISI (2020), *North American Specification for the Design of Cold-Formed Steel Structural Members,* AISI S100-16 w/S2-20, American Iron and Steel Institute, 25 Massachusettes Avenue, NW, Suite 800, Washington, DC 20001

AISI (2020), *North American Specification for the Design of Profiled Steel Diaphragm Panels,* AISI S310-20, American Iron and Steel Institute, 25 Massachusettes Avenue, NW, Suite 800, Washington, DC 20001

Cost Impact: The code change proposal will decrease the cost of construction
By recognizing some of the tests that containers have already been certified to under international standards, some of the structural components do not need to be verified by material testing or structural investigation.

G196-21

G197-21

IBC: 3115.8.4, 3115.8.4.2, 3115.8.4.3, 3115.8.5, 3115.8.5.2, 3115.8.5.3, TABLE 3115.8.5.3

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

2021 International Building Code

Revise as follows:

SECTION 3115 INTERMODAL SHIPPING CONTAINERS.

3115.8.4 Detailed structural design procedure. A structural analysis meeting the requirements of this section shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Intermodal shipping containers designed in accordance with Section 3115.8.5.

3115.8.4.2 Seismic design parameters. The seismic force-resisting system shall be designed and detailed in accordance with one of the following:

1. Where all or portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are considered to be the seismic force-resisting system, design and detailing shall be in accordance with the ASCE 7, Table 12.2-1 requirements for light-frame bearing-wall systems with shear panels of all other materials.
2. Where portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are retained, but are not considered to be the seismic force-resisting system, an independent seismic force-resisting system shall be selected, designed and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where portions of the ~~corrugated steel~~ intermodal shipping container ~~sides~~ elements are retained and integrated into a seismic force-resisting system other than as permitted by Section 3115.8.4.2 Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

3115.8.4.3 Allowable shear value. The allowable shear values for the *intermodal shipping container* ~~corrugated steel sheet panel~~ side walls and end walls shall be demonstrated by testing and analysis accordance with Section 104.11. Where penetrations are made in the side walls or end walls designated as part of the lateral force-resisting system, the p enetrations shall be substantiated by rational analysis.

3115.8.5 Simplified structural design procedure of single-unit containers. Single-unit *intermodal shipping containers* conforming to the limitations of Section 3115.8.5.1 shall be permitted to be designed in accordance with ~~the simplified structural design provisions of Section3115.8.5.2~~ Sections 3115.8.5.2 and 3115.8.5.3.

3115.8.5.2 ~~Simplified structural~~ Structural design assumptions. Where permitted by Section 3115.8.5.1, single-unit, stand-alone intermodal shipping containers shall be designed using the following assumptions for the~~corrugated steel shear~~ side walls and end walls:

1. The appropriate detailing requirements contained in Chapters 16 through 23.
2. Response modification coefficient, R = 2.
3. Overstrength factor, $\Omega_0 = 2.5$.
4. Deflection amplification factor, $C_d = 2$.
5. Limits on structural height, $h_n = 9.5$ feet (2900 mm).

3115.8.5.3 Allowable shear. The allowable shear for the ~~corrugated steel~~ intermodal shipping container side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section 3115.8.5.2 shall be in accordance with Table 3115.8.5.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure 3115.8.5.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure 3115.8.5.3(2).
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure 3115.8.5.3(3).
4. Where openings are made in the intermodal shipping container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure 3115.8.5.3(4).
6. End wall doors designated as part of the lateral force-resisting system shall be welded closed.

TABLE 3115.8.5.3
ALLOWABLE SHEAR VALUES FOR INTERMODAL SHIPPING CONTAINER ~~CORRUGATED STEEL~~ SIDE WALLS AND END WALLS FOR WIND OR SEISMIC LOADING

CONTAINER DESIGNATION[b]	CONTAINER DIMENSION (nominal length)	CONTAINER DIMENSION (nominal height)	ALLOWABLE SHEAR VALUES (PLF)[a, c]	
			Side Wall	End Wall
1EEE	45 feet	9.5 feet	75	843
1EE		8.5 feet		
1AAA	40 feet	9.5 feet	84	
1AA		8.5 feet		
1A		8.0 feet		
1AX		< 8.0 feet		
1BBB	30 feet	9.5 feet	112	
1BB		8.5 feet		
1B		8.0 feet		
1BX		< 8.0 feet		
1CC	20 feet	8.5 feet	168	
1C		8.0 feet		
1CX		< 8.0 feet		
1D	10 feet	8.0 feet	337	
1DX		< 8.0 feet		

For SI: 1 foot = 304.8 mm.

a. The allowable strength shear values for the side walls and end walls of the intermodal shipping containers are derived from ISO 1496-1 and reduced by a factor of safety of 5.

b. Container designation type is derived from ISO 668.

c. Limitations of ~~Section~~ Sections 3115.8.5.1 and 3115.8.5.3 shall apply.

Reason Statement: Most of the modifications contained in this code change proposal represent editorial changes to terminology as a result of comments received following the introduction of the Intermodal Shipping Container proposals in 2018 and 2019. These comments included concerns about redundancy and including language that is consistent with Chapter 16 Structural provisions.
3115.8.4. Proposed editorial change to the subsection title to insert the word “structural” to reflect that the design provision contained herein is structural in nature.

3115.8.4.2 Item 3. Proposed editorial change to reference the correct section. The intended section reference is supposed to be 3115.8.4.2 Item 1, not 3115.4.2 Item 1 as that section does not exist.

3115.8.4.2, 3115.8.5.2, 3115.8.5.3, and Table 3115.8.5.3. During the Code Action Hearing for the 2018 Group A Code Development Cycle, the Code Action Committee recommended to the proponent to change the wording as part of a public comment. This was inadvertently missed during the Public Comment Hearing. This proposed editorial change is to strike out the words “corrugated steel” and “sides” and replace with the words “intermodal shipping container” and “elements”. The intent to emphasize the entirety of the structural elements (i.e., corrugated steel, top and bottom railing, and side columns) contributes to the lateral force resisting system and not just the individual corrugated steel component.

3115.8.5. Proposed editorial change to the subsection title to insert the word “procedure” reflect the emphasis on structural design procedure of this provision.

Table 3115.8.5.3. Proposed editorial change to the table footnote (a) to insert the word “value” to properly complete the sentence and table footnote (c) to include sections with the applicable conditions for using this table.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes are editorial in nature, does not change any technical requirement, and as a result should not have any impact on construction cost.

G197-21

G198-21

IBC: 3115.8.2, 3115.8.4, 3115.8.4.2, 3115.8.5.3

Proponents: Julie Furr, Rimkus Consulting Group, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (jfurr@rimkus.com); Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (kcobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov); Ronald LaPlante, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (ron.laplante@dgs.ca.gov)

2021 International Building Code

Revise as follows:

3115.8.2 Welds. The strength of new ~~New~~ welds and connections shall be no less ~~equal to or greater~~ than the strength provided by the original connections. All new welds and connections shall be designed and constructed in accordance with Chapters 16, 17, and 22.

3115.8.4 Detailed design procedure. A structural analysis meeting the requirements of this section shall be provided to the *building official* to demonstrate the structural adequacy of the intermodal shipping containers.

Exception: Structures using an intermodal ~~Intermodal~~ shipping container ~~containers~~ designed in accordance with Section 3115.8.5.

3115.8.4.2 Seismic design parameters. The seismic force-resisting system shall be designed and detailed in accordance with ASCE 7 and one of the following:

1. Where all or portions of the corrugated steel container sides are considered to be the seismic force-resisting system, design and detailing shall be in accordance with the ASCE 7, Table 12.2-1 requirements for light-frame bearing-wall systems with shear panels of all other materials. ASCE 7 seismic provision exceptions, related to light-frame construction, shall not apply to the design of structures using intermodal shipping containers. The allowable shear values shall be determined in accordance with Section 3115.8.4.3.
2. Where all or portions of the corrugated steel container sides are ~~retained, but are~~ not considered to be part of the seismic force-resisting system, an independent seismic force-resisting system shall be selected~~, designed~~ and detailed in accordance with ASCE 7, Table 12.2-1.
3. Where all or portions of the corrugated steel container sides are retained and integrated into a seismic force-resisting system other than as permitted by Item 1, seismic design parameters shall be developed from testing and analysis in accordance with Section 104.11 and ASCE 7, Section 12.2.1.1 or 12.2.1.2.

3115.8.5.3 Allowable shear. The allowable shear for the corrugated steel side walls (longitudinal) and end walls (transverse) for wind design and seismic design using the coefficients of Section 3115.8.5.2 shall be in accordance with Table 3115.8.5.3, provided that all of the following conditions are met:

1. The total linear length of all openings in any individual side wall or end wall shall be limited to not more than 50 percent of the length of that side wall or end wall, as shown in Figure 3115.8.5.3(1).
2. Any full-height wall length, or portion thereof, less than 4 feet (305 mm) shall not be considered as a portion of the lateral force-resisting system, as shown in Figure 3115.8.5.3(2).
3. All side walls or end walls used as part of the lateral force-resisting system shall have an existing or new boundary element on all sides to form a continuous load path, or paths, with adequate strength and stiffness to transfer all forces from the point of application to the final point of resistance, as shown in Figure 3115.8.5.3(3). The existing door interlocking mechanism shall not be considered as a component of the required load path.
4. Where openings are made in container walls, floors or roofs, for doors, windows and other openings:

   4.1 The openings shall be framed with steel elements that are designed in accordance with Chapters 16 and 22.

   4.2 The cross section and material grade of any new steel element shall be equal to or greater than the steel element removed.

5. A maximum of one penetration not greater than 6 inches (152 mm) in diameter for conduits, pipes, tubes or vents, or not greater than 16 square inches (10 323 mm^2) for electrical boxes, is permitted for each individual 8-foot (2438 mm) length of lateral force-resisting wall. Penetrations located in walls that are not part of the lateral force-resisting system shall not be limited in size or quantity. Existing *intermodal shipping container* vents shall not be considered a penetration, as shown in Figure 3115.8.5.3(4).
6. End wall doors designated as part of the lateral force-resisting system shall be welded closed~~.~~ around the full perimeter of the door panels.

Reason Statement: Section 3115.8.2 is not clear as to what welds and connections this applies to, nor does it clarify what is meant by “equal to or greater than” (strength, size, or other). This change clarifies that it is the “strength” of the welds and connections that should be assessed for equivalency. The proposed language clarifies that new welds shall comply with minimum design standards as already specified elsewhere in the IBC.
Section 3115.8.4.2 is modified to include direct reference to ASCE 7 to capture the seismic design provisions, such as combination of seismic force-

resisting systems, regardless of which of the 3 design items are selected. The first proposed change to Item 1 is to not permit simplified and relaxed requirements in ASCE 7, intended specifically for light-frame construction, to be applied to steel shipping containers since these containers may not exhibit similar seismic response characteristics as light-frame construction. The second proposed change to Item 1 is to tie the system seismic parameters to the system capacity by direct reference to Section 3115.8.4.3. This is also intended to further clarify that the allowable shear values contained in the simplified procedure shown in Table 3115.8.5.3 are not intended to be permitted with the detailed design procedure. The proposed changes in Items 2 and 3 are editorial to be consistent with Item 1.

Section 3115.8.5.3 is modified to ensure that the allowable shear in Table 3115.8.5.3 for the end wall with doors is based on an adequate load path between the door panels and boundary elements, as determined by established design theory. The perimeter welds of the end door panels are to be designed per Section 3115.8.2 and may be continuous or intermittent as required by design. These changes further clarify that the original mechanical locking mechanisms shall not be relied upon to function as a lateral force-resisting system component of the repurposed shipping container.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes are editorial in nature and intended to clarify the design requirements.

G198-21

G199-21 Part I

PART I - IBC: 3301.1, 3301.2, [BS] 3301.2.1, SECTION 3302, 3302.1, 3302.1.1 (New), 3302.2, 3302.3, 3302.3.1 (New); IEBC: 1501.1, 1501.2, 1501.2.1, [BS] 1501.3, 1501.4, 1501.5, 1501.7, SECTION 1502(New), 1502.1(New), 1502.1.1(New), 1502.2(New), 1502.3(New), 1502.3.1(New), SECTION 1503(New), SECTION 1504(New)
PART II - IFC: 3303.1.1, 3303.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

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

2021 International Building Code

SECTION 3301 GENERAL.

Revise as follows:

3301.1 Scope. The provisions of this chapter shall govern safety during construction and the protection of adjacent public and private properties. Fire safety during construction shall also comply with the applicable provisions of Chapter 33 of the International Fire Code.

3301.2 Storage and placement of construction equipment and materials. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

[BS] 3301.3 ~~3301.2.1~~ Roof ~~Structural and construction~~ loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment*loads* that will be encountered during installation of the system.

3301.4 ~~3302.1~~ Maintenance of exits, existing structural elements, fire protection devices and sanitary safeguards~~Alterations, repairs and additions~~. Required *exits*, existing structural elements, fire protection devices and sanitary safeguards shall be maintained at all times during *alterations*, *repairs* or *additions* to any building or structure.

Exceptions:

1. Where such required elements or devices are being altered or repaired, adequate substitute provisions shall be made.
2. Maintenance of such elements and devices is not required where the existing building is not occupied.

3301.5 ~~3302.2~~ Removal of waste materials~~Manner of removal~~. Waste materials shall be removed in a manner that prevents injury or damage to persons, adjoining properties and public rights-of-way.

~~**3302.3 Fire safety during construction.** Fire safety during construction shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code.~~

SECTION 3302 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~CONSTRUCTION SAFEGUARDS~~.

Add new text as follows:

3302.1 Site Safety Plan. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of an approved, written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall be submitted and approved before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of the International Fire Code, the duties of staff, and staff training requirements. The plan shall be submitted for approval in accordance with the *International Fire Code.*

3302.1.1 Components of site safety plans. Site safety plans shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where approved, and signage locations in accordance with the *International Fire Code.*
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.

9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of flammable and combustible liquids and other hazardous materials.
11. Provisions for site security and, where required, for a fire watch.
12. Changes that affect this plan.
13. Other site-specific information required by the *International Fire Code*.

3302.2 Site safety director. The owner shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the site safety plan. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with the International Fire Code, the site safety director shall be responsible for the guard service.

3302.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site inspection and review.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in the *International Fire Code*, and hot work is performed only in areas approved by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by the *International Fire Code* are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3311.
10. Portable fire extinguishers are available in locations required by Sections 3309 and for roofing operations in accordance with the *International Fire Code*.
11. Where a fire watch is required, fire watch records complying with the International Fire Code are up-to-date.

3302.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 114.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 114.2. Upon the third offense, the Building Official is authorized to issue a stop work order in accordance with Section 115, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the Building Official.

2021 International Existing Building Code

SECTION 1501 GENERAL.

Revise as follows:

[BG] 1501.1 Scope. The provisions of this chapter shall govern safety during construction and the protection of adjacent public and private properties. Fire safety during construction shall also comply with the applicable provisions of Chapter 33 of the International Fire Code

[BG] 1501.2 Storage and placement of construction equipment and materials. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

[BS] ~~1501.2.1~~ 1501.3 ~~Structural and construction~~ Roof loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system.

[BG] ~~1501.3~~ 1501.4 ~~Alterations, repairs and additions~~ Maintenance of exit s, existing structural elements, fire protection devices and sanitary safeguards. Required exits, existing structural elements, fire protection devices and sanitary safeguards shall be maintained at all times during*alterations*, *repairs* or *additions* to any building or structure.

Exceptions:

1. Where such required elements or devices are being altered or repaired, adequate substitute provisions shall be made.
2. Maintenance of such elements and devices is not required where the *existing building* is not occupied.

[BG] ~~1501.4~~ 1501.5 Removal of waste materials ~~Manner of removal~~. Waste materials shall be removed in a manner that prevents injury or damage to persons, adjoining properties and public rights-of-way.

Delete without substitution:

~~**[BG] 1501.5 Fire safety during construction.** Fire safety during construction shall comply with the applicable requirements of the *International Building Code* and the applicable provisions of Chapter 33 of the International Fire Code.~~

Add new text as follows:

SECTION 1502 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION.

1502.1 Site Saf et y Plan. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of an approved, written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall be submitted and approved before a building permit is issued, Any changes to the plan shall address the requirements of this chapter and other applicable portions of the International Fire Code, the duties of staff, and staff training requirements. The plan shall be submitted for approval in accordance with the International Fire Code.

1502.1.1 Components of site safety plans. Site safety plans shall include the following as applicable:

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

1502.2 Site safety director. The owner shall designate a person to be the site safety director. The site safety director shall be responsible for ensuring compliance with the site safety plan. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with the International Fire Code, the site safety director shall be responsible for the guard service.

1502.3 Daily fire safety inspect ion. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site inspection and review.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in the International Fire Code, and hot work is performed only in areas approved by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the site safety director when not involved in work that is being performed.

6. Fire apparatus access roads required by the International Fire Code are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 1506.
10. Portable fire extinguishers are available in locations required by Sections 1504 and for roofing operations in accordance with the International Fire Code.
11. Where a fire watch is required, fire watch records complying with the International Fire Code are up-to-date.

1502.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 114.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 114.2. Upon the third offense, the Building Official is authorized to issue a stop work order in accordance with Section 115, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the Building Official.

SECTION 1503 SANITARY.

Revise as follows:

[BG] ~~1501.7~~ 1503.1 Facilities required. Sanitary facilities shall be provided during construction or demolition activities in accordance with the *International Plumbing Code* .

Add new text as follows:

SECTION 1504 PROTECTION OF PEDESTRIANS. *(Renumber 1501.6 through 1501.6.7 as 1504 subsections)*

G199-21 Part I

G199-21 Part II

PART II - IFC: 3303.1.1, 3303.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2021 International Fire Code

Revise as follows:

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

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

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

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.
10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.
11. <u>Where a fire watch is required in accordance with Section 3305.5, fire watch records required by that section are up-to-date.</u>

Reason Statement: Correlation with IFC for provisions for construction site safety that a building inspector can reasonably verify and enforce while onsite doing other scheduled inspections. Clearly, building inspectors are plenty busy with scheduled inspections, and we are not looking to bog them down with additional work touring the site for safety violations. But, having them verify that required owner/manager site safety inspections are being documented is a minimal step to improving construction site safety. Also, IFC reference is moved to the scope for improved visibility and provisions have been added to clarify that a fire watch, where required, and associated records should be part of the safety play and records inspection.
It is recommended that the new section be scoped to the Fire Code for maintenance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Provisions being modified in the IBC are already in the IFC. Changes are for clarity and coordination between the codes.

G199-21 Part II

G200-21

IBC: 3310.1; IFC: [BE] 3312.1; IEBC: [BE] 1505.1

Proponents: Homer Maiel, PE, CBO, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

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

2021 International Building Code

Revise as follows:

3310.1 Stairway required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided~~. As construction progresses, ~~such *stairway* shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

2021 International Fire Code

Revise as follows:

[BE] 3312.1 Stairways required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided.~~ As construction progresses, ~~such *stairway* shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

2021 International Existing Building Code

Revise as follows:

[BE] 1505.1 Stairways required. ~~Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent stairway shall be provided.~~ As construction progresses, ~~such stairway shall be extended to within one~~ all stairways approved per plan shall be extended to the floor of the highest point of construction having secured decking or flooring. A temporary stairway shall be provided and approved for each permitted stairway that is not completed in construction.

Reason Statement: As many trade workers, building inspectors, superintendent's, engineers all navigate these floors while they are under construction, there are notably many stairways that are not roughed in for use. Many of them remain incomplete until much further into the advanced stages of the project. The Axis Appartment fire that happend in Houston Texas On March 25, 2014 (link is provided here) shows how a construction worker jumps from one balcony to balcony below to save his life. A stairway in this case would have made the rescue much easier. https://www.khou.com/article/news/investigations/video-shows-new-perspective-of-dramatic-fire-rescue/285-215404218

Stairways are completed to the point where they are useable going up or down, and they are used as staging areas for fire extinguishers and other fire protection equipment. Unfortunately, with changing conditions and just a guardrail at some of these stair shafts, the fire extinguishing equipment is tossed aside with nowhere to be placed while construction is going on. The fire extinguishers need a home while construction is going on, and the landings at each level in the stairwells are their designation per IFC, IBC and OSHA. Per OSHA Safety and Health regulations for Construction, Subpart Fire Protection and Prevention, 1926.150(c)(1)(iv) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction should not be impacted since these stairways have to be built anyway.

G200-21

G201-21

IBC: APPENDIX Q (New)

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

2021 International Building Code

Add new text as follows:

APPENDIX Q
TEMPORARY STRUCTURES AND USES TO SERVE EMERGENCIES

Q101 GENERAL.

Q101.1 Scope. The provisions of this appendix shall apply to the use, construction, installation, alteration, relocation and location of emergency need based temporary structures and any service utilities or systems that serve such temporary structures.

Q101.1.1 Objectives. The objective of this Appendix is intended to provide flexibility to permit the use of innovative approaches and techniques to establish temporary structures and uses in a timely fashion while encountering unusual circumstances and maintain the level of safety intended by the code.

Q101.1.2 Temporary use. Temporary use during emergencies may exceed 180 days. Judgement shall be used by the code official to allow for temporary uses and conditions to continue for the duration of the emergency based on the needs of the emergency. The building official is authorized to grant extensions for demonstrated cause.

Q102 DEFINITIONS.

Q102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

Add new definition as follows:

EMERGENCY. . Any event declared by local, state, or federal entities that temporarily overwhelms response capabilities, and may require the suspension or modification of regulations, codes, or standards to facilitate response to such an event.

TEMPORARY STRUCTURES. . That which is built, constructed or erected for a period of less than 180 days.

TEMPORARY USE. An activity or practice that is established at designated location for a period of less than 180 days. Uses include, but are not limited to, those functional designations listed within the occupancy group descriptions in Section 302.1 of this code.

Add new text as follows:

Q103 SUBMITTAL DOCUMENTS.

Q103.1 General. Submittal documents shall be of sufficient clarity to indicate the location, nature and extent of the work or use proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the code official.

Q104 CONFORMANCE.

Q104.1 Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this section as necessary to provide a reasonable level of safety, health and general welfare.

Q104.2 Changes over time. As an emergency evolves, and more resources become available, plans should be made to bring structures and temporary uses in line with the main body of the code.

Q105 PERMITS.

Q105.1 Required permits. Temporary structures other than tents and other membrane structures that occupy an area greater than 120 square feet (11.16 m^2), shall not be erected, operated or maintained for any purpose without obtaining a permit from the code official. Tents and membrane structures should be permitted in accordance with the International Fire Code.

Q106 GENERAL STANDARDS FOR EMERGENCY STRUCTURES.

Q106.1.1 Scope. The provisions of Sections Q106.2 through Q106.7 shall apply to all structures constructed, erected or relocated during emergencies.

Q106.2 Intent. The intent of this section is to provide a base level of safety in a structure built or repurposed for emergency use.

Q106.3 Change of occupancy. Existing buildings used in a way that was not originally intended by occupancy class or use shall be allowed without formally changing the occupancy class. The previous occupancy class shall be restored upon the conclusion of the emergency.

Q106.4 Fire Safety Provisions. Determine fire safety requirements in accordance with Section Q106.4.1 through Q106.4.5 in order to make determinations of safe conditions rather than strict adherence to the provisions of International Fire Code.

Q106.4.1 Fire safety and evacuation plans. Fire Safety and evacuation plans shall be provided in accordance with Section 403 and 404 of the International Fire Code. Plans should be updated where there are any physical changes to the layout of the structure.

Q106.4.2 Training and practice drills. Training of staff and practice drills shall comply with Section 405 and 406 of the International Fire Code. Structures in place for longer than 30 days shall conduct evacuation drill in accordance with Section 405.3 of the International Fire Code based on the temporary use.

Q106.4.3 Fire Protection. An evaluation shall be performed to decide on fire protection needed utilizing NFPA 550.

Q106.4.4 Emergency Access. Emergency vehicle access roads shall be approved by the fire code official.

Q106.4.5 Fire Watch. A fire watch in accordance with Section 403.11.1 of the International Fire Code shall be permitted to be provided in lieu of other fire protection system.

Q106.5 Means of Egress. Means of Egress shall comply with Sections 1004, 1005, 1006, 1007, 1008 and 1010 of the International Building Code in addition to Sections Q106.5.1 through Q106.5.3.

Q106.5.1 Exit Discharge. Exits shall provide access to a public way, or to a safe dispersal area in accordance with 1028.5.

Q106.5.2 Means of Egress Lighting. The means of egress shall be illuminated when the space is occupied.

Exception: Sleeping areas.

Q106.5.3 Exit Signs. Exit signs shall be provided where the means of egress is not readily identifiable. Exit signs shall be permitted to be illuminated by the lighting provided in the structure.

Q106.6 Accessibility. A facility that is constructed to be accessible shall be maintained accessible during occupancy.

Q106.7 Temporary connection. The code official shall have the authority to authorize the temporary connection of the building or system to the utility, the source of energy, fuel, or power, or the water system or sewer system in accordance with Section 112. Water closets and lavatories shall be either permanent plumbing fixtures installed within the structure, or temporary water closets or lavatories, such as chemical toilets or other means approved by the code official.

Q106.7.1 Portable heating and cooling equipment. Portable heating and cooling equipment shall be used in accordance with their listing, and manufacturer's instructions.

Q107 Use Specific Standards.

Q107.1 Increased occupant load. Temporary waivers for allowing for additional occupants in existing building shall comply with Section Q107.1.1 through Q107.1.3.

Q107.1.1 Authorization. The code official is authorized to allow for an increase in the number of occupants or a change of use in a building or portion of a building during an emergency.

Q107.1.2 Maintenance of the means of egress. The existing a means of egress shall be maintained.

Q107.1.3 Sleeping areas. Where a space is used for sleeping purposes, the space shall be equipped with smoke alarms in accordance with Section 907.2.11 or be provided with a fire watch in accordance with Section 403.11.1 of the International Fire Code. Carbon monoxide detectors shall be installed in accordance with Section 915 where the structure uses any fossil fuel or wood burning appliances.

Q107.2 Temporary healthcare facilities. . Temporary health care facilities shall comply with Section Q107.2.1 and Q107.2.2.

Q107.2.1 General. Temporary health care facilities shall be erected, maintained and operated to minimize the possibility of a fire emergency requiring the evacuation of occupants.

Q107.2.2 Membrane structures under projections. . Membrane structures of less than 100 square fe et (9.3 m^2) may be placed under projections of a permanent building provided the permanent building is protected with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

Q107.3 Use of tiny houses or manufactured housing. . Tiny houses or manufactured housing used for temporary housing shall comply with Section Q107.3.1 through Q107.3.5.

Q107.3.1 Fire separation distances. Tiny houses or manufactured housing shall be separated by not less than 5 feet (1524 mm) between structures.

Q107.3.2 Fire breaks. Tiny houses and manufactured housing shall not be located in groups of more than 20 units. Fire breaks of at least 20 feet (6096 mm) shall be provided between each group.

Q107.3.3 Smoke alarms. Tiny houses and manufactured housing used for sleeping purposes shall be equipped with a smoke alarm complying with Section 907.2.11. Smoke detectors are not required to be hard wired.

Q107.3.4 Carbon monoxide detectors. Carbon monoxide detectors shall be installed in accordance with Section 915, where the tiny house or manufactured housing uses any fossil fuel or wood burning appliances.

Q107.3.5 Structures located in a wildland urban interface zone. Tiny houses and manufactured housing that are located in a wildland urban interface area shall be provided with defensible space in accordance with the Section 603 of the International Wildland Urban Interface Code.

Q107.4 Tents and membrane structures used as sleeping accommodations. Tents or membrane structures used as sleeping accommodations shall comply with the same requirements as tiny homes in Section Q107.3.1 through Q107.3.5 and Chapter 31 of the International Fire Code.

Q107.5 Temporary emergency shelters during/after a natural disaster – wildfire, tornado, flood. . Where emergency shelters are planned, the process of organizing, planning, implementing, and evaluating a program for mass evacuation, sheltering, and re-entry shall comply withNFPA 1660.

SECTIONQ108 REFERENCED STANDARDS.

Q108.1 General. SeeTable Q108.1for standards that are referenced in various sections of this appendix.Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix referenced in the standard.

Add new text as follows:

TABLE Q108.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
NFPA 550-2017	Guide to the Fire Safety Concepts Tree	Q106.5.3
NFPA 1660 - 2022	Standard on Community Risk Assessment, Pre-Incident Planning, Mass Evacuation, Sheltering, and Re-entry Programs.	Q107.5

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 550-2017 and NFPA 1660-2022, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: The purpose of the proposed Appendix is to provide regulatory options to users based on trends that don't fit squarely in the IBC. Code users are facing diverse challenges never encountered before. Examples include setting up medical facilities in gymnasiums, or in tents in a park or parking lot. With the wildfires in the Western United States, emergency temporary housing is needed for displaced residents, as well as First Responders from other areas who are providing assistance. The Appendix format allows for Jurisdictional adoption with or without amendments, creating solutions for these types of uses, providing the AHJ with wide flexibility while ensuring public health, safety and general welfare for the end users
There will be related proposals submitted in group B.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These options mirror established ICC codes sections and standards.

G201-21

G202-21

IBC: APPENDIX P (New)

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Building Code

Add new text as follows:

APPENDIX P
3D PRINTED BUILDING CONSTRUCTION

SECTION P101 GENERAL.

P101.1 Scope. Buildings, structures and building elements fabricated in whole or in part using 3D printed construction techniques shall be designed, constructed and inspected in accordance with the provisions contained in this Appendix and other applicable requirements in this code.

> **Exception:** Where approved, 3D printed buildings, structures and building elements are permitted to be evaluated in accordance with engineering practices judged equivalent to the design, construction, inspection and integrity of construction requirements in this Appendix in accordance with Section 104.11.

SECTION P102 DEFINITIONS.

P102.1 Definitions. The following words and terms shall, for the purposes of this Appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

Add new definition as follows:

3D PRINTED BUILDING CONSTRUCTION. A process for fabricating buildings, structures and building elements from 3D model data using automated equipment that deposits construction material in a layer upon layer fashion.

ADDITIVE MANUFACTURING MATERIALS. Materials used by the 3D printer to produce the building structure or system components of the building.

FABRICATION PROCESS. Preparation of the job site and construction material, and the deposition, curing, finishing, insertion of components and other methods used to construct building elements such as walls, partitions, roof assemblies and structural components, and the means used to connect assemblies together.

PRODUCTION EQUIPMENT. The equipment, including 3D printer, its settings, nozzles and other accessories used in the fabrication process.

REPORT OF FINDINGS. A report issued by an approved agency that provides a technical basis for accepting prefabricated or 3D printed building assemblies. It describes the building assembly construction covered, and provides a summary of the test results, ratings, material properties, and/or material performance characteristics established by evaluation or test.

Add new text as follows:

SECTION P103 BUILDING DESIGN.

P103.1 Design. 3D printed buildings, structures and building elements shall be designed by an organization certified in accordance with UL 3401 by an approved agency and approved by the *building official*

P103.2 Design approval. The structural design, construction documents, and UL 3401 *report of findings* shall be submitted for review and approval in accordance with Section 104.11.

SECTION P104 BUILDING CONSTRUCTION.

P104.1 Construction. 3D printed buildings, structures, and building elements shall be constructed in accordance with Sections P104.2 through P104.4.

P104.2 Construction method. The building construction method, consisting of the manufacturer's *production equipment* and fabrication process shall be in accordance with the UL 3401 *report of findings* . The unique identifier of the construction method used shall match the identifier in the UL 3401 *report of findings* .

P104.3 Additive manufacturing materials. Only the listed *additive manufacturing materials* identified in the UL 3401 *report of findings* shall be used to fabricate the building structure. Containers of the *additive manufacturing materials* shall be labeled.

P104.4 Depositing of manufacturing materials. Manufacturing materials shall only be deposited where ambient temperature and environmental conditions at the job site are within limits specified in the UL 3401 *report of findings* . The maximum number of layers permitted, specified curing time and any surface preparation of finishing shall be performed as specified in the UL 3401 *report of findings* .

SECTION P105 SPECIAL INSPECTIONS.

P105.1 Initial inspection. . An initial inspection of the *production equipment* , including the 3D printer, and the fabrication process shall be performed after the *production equipment* is located onsite and before building fabrication has begun. The inspection shall be conducted by the representatives of the approved agency that evaluated the fabrication process for compliance with UL 3401. The inspection shall verify that the fabrications process, including *production equipment* , 3D printing parameters and *additive manufacturing materials* are in accordance with the UL 3401 *report of findings*, and the proprietary information in the UL 3401 detailed *report of findings* .

> **Exception:** Where approved by the building official, inspection of the *production equipment* , including 3D printer, and the fabrication process used in replicable buildings shall be permitted to be conducted on the first building to be constructed, and on a selected number of subsequent buildings, where the same equipment, equipment operators and fabrication process are used on all buildings. The number of inspections to be performed shall be determined by the building official.

SECTION P106 REFRENCED STANDARDS.

P106.1 General. See Table P106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, the standard title and the section or sections of this appendix that reference the standard.

P106.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
UL 3401-19	Outline of Investigation for 3D Printed Building Construction	P103.2, P104.2, P104.3, P104.4, P105.1

Staff Analysis: A review of the standard proposed for inclusion in the code, UL 3401-19, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2021.

Reason Statement: 3D building construction has moved from a conceptual stage to reality, and projects are being proposed in an increasing number of jurisdictions. Unfortunately the prescriptive design and construction requirements in the IBC are not applicable to 3D printed fabrication techniques, so code officials have to approve this construction based on limited equivalency evaluations that may not take into account variations in material properties introduced by the 3D printing process, or variances in the physical characteristics of the construction materials used.
This proposal introduces an Appendix P, which is not mandatory unless specifically referenced in an adopting ordinance. The Appendix includes definitions, and requirements for 3D printed building design, construction and special inspections, which rely on the design being evaluated in advance by an approved agency for compliance with UL 3401. The resulting report of findings includes the information needed by the contractor and code official to verify compliance with applicable code requirements, and to verify that the 3D printing process and materials used on site are the same as those used during the UL 3401 evaluation and testing. The special inspection requirements are necessary because the portions of the fabrication process such as 3D printer settings, deposition rates and thickness, and curing processes, require special expertise to evaluate, especially when they include proprietary formulations, equipment and settings.

The exception to Section P101 recognizes there may be other published standards that evaluate 3D printed building construction, although we are not aware of any such standard for 3D printed building construction that is as comprehensive as UL 3401.

A similar Appendix was added to the 2021 International Residential Code. At present one company has received coverage for UL 3401 certification, and several others are in process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal covers a construction technique that is not currently addressed in the code.

G202-21

G203-21

IBC: APPENDIX S (New), SECTION S101 (New), SECTION N101, SECTION S102 (New), S102.1 (New), TABLE S102.1 (New), AARST (New), AARST ANSI-AARST CC-1000-2018: (New), AARST ANSI-AARST RRNC-2020: (New)

Proponents: Jane Malone, American Association of Radon Scientists and Technologists, representing American Association of Radon Scientists and Technologists; Thomas Bowles, representing EPA (bowles.thomas@epa.gov); Ruth Mcburney, representing CRCPD (rmcburney@crcpd.org); Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org); Kevin Stewart, American Lung Association, representing American Lung Association (Kevin.Stewart@Lung.org); Tobie Bernstein, representing Environmental Law Institute (bernstein@eli.org); David Kapturowski, representing Spruce Environmental Technologies, Inc. (dave@spruce.com)

2021 International Building Code

Add new text as follows:

APPENDIX S
SOIL GAS CONTROL

SECTION S101 GENERAL.

S101.1 Venting requirements. Soil gas control systems shall comply with ANSI-AARST CC-1000.

> **Exception:** Radon control systems in one- and two-family dwellings and townhouse shall comply with Appendix F of the International Residential Code or ANSI-AARST RRNC.

SECTION S102 REFERENCED STANDARDS.

S102.1 General. See Table S102.1 for standards that are referenced in various sections of this appendix. Standards listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE S102.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ANSI-AARST CC-1000-2018 [a]	Soil Gas Control Systems in New Construction of Buildings	S101.1
ANSI-AARST RRNC-2020 [a]	Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses	S101.1

a. AARST - American Association of Radon Scientists and Technologists

Add new standard(s) as follows:

AARST

American Association of Radon Scientists and Technologists
527 N Justice Street
Hendersonville NC 28739
USA

AARST ANSI-AARST CC-1000-2018: Soil Gas Control Systems in New Construction of Buildings.

AARST ANSI-AARST RRNC-2020: Rough-In of Radon Control Components In New Construction Of 1 & 2 Family Dwellings And Townhouses.

Staff Analysis: A review of the standard proposed for inclusion in the code, AARST RRNC-2020 and AARST CC1000-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

Reason Statement: Several states (Illinois, Maine, Minnesota, Nebraska, New Jersey, Oregon, Rhode Island, Washington) require soil gas control in new buildings that cannot possibly be addressed through Appendix F of the International Residential Codes, such as schools, child day care facilities, and multifamily housing. Even where there are no requirements, builders are including some form of soil gas control in buildings. The IBC lacks any meaningful provision to oversee soil gas control systems in larger buildings.

The proposed new Appendix to the IBC will position the current standard for soil gas control in large buildings available as an enforcement tool for code officials and provide consistency among builders, architects, and developers and across jurisdictions.

Radon is present in indoor air everywhere, regardless of building type or radon zone. Radon-induced lung cancer takes 21,000 lives in the US each year. Chemical vapor is an increasingly documented hazard that also enters buildings from the soil.

It is more efficient and cost-effective to establish soil gas control from the ground up during construction than to retrofit a structure later to seal up the interface between structure and soil and position suction points, ventilation piping and other components.

The exception allows the use of Appendix F of the IRC, or the applicable current consensus standard ANSI-AARST RRNC, to be used for one- and two-family homes.

The standards included in this proposal have been vetted and approved by EPA, multiple regulatory states, and HUD. They are posted for public access at **https://standards.aarst.org/CC-1000-2018/index.html** and **https://standards.aarst.org/RRNC-2020/index.html**
In 2020, an addendum to ASHRAE 189.1 - 2017 was approved to incorporate a requirement for ANSI-AARST CC-1000 to replace the standard's existing soil gas requirement.

Cost Impact: The code change proposal will increase the cost of construction
This proposal does not add a requirement to install a radon control system. The proposal will add incremental cost to construction where radon control systems are installed if the builder is not already following the standard practice.
According to the Home Innovation Research Labs' Radon-Resistant Construction Practices in New U.S. Homes, the average reported per-unit installation cost of an active radon system in a multifamily dwelling in 2018 was $845, lower than $865 in 2017 but higher than $757 in 2016. The same paper indicates that in 2018 the average multifamily dwelling had an average selling price of $229,260. The cost of a system for a nonresidential commercial building will range from $2500 to higher depending on the footprint, volume and type of HVAC system.

G203-21

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IBC: [F] 403.4.8.1.1 (New); IFC: 914.3.8 (New)

Proponents: Thomas Wysocki, Fire Suppression Systems Association, representing Fire Suppression Systems Association, Technical Director (twysocki@gsifire.com)

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

2021 International Building Code

Add new text as follows:

[F] 403.4.8.1.1 Generator rooms. Emergency and standby equipment rooms that have a generator set within high-rise buildings as required by Section 2702.2.11, shall be protected with an alternative automatic fire-extinguishing systems in accordance with Section 904.

2021 International Fire Code

Add new text as follows:

914.3.8 Generator rooms. Emergency and standby equipment rooms that have a generator set within high-rise buildings as required by Section 2702.2.11 of the *International Building Code*, shall be protected with an alternative automatic fire-extinguishing systems in accordance with Section 904.

Reason Statement: History of fires
The February 2013 NFPA research study written by John R. Hall, Jr., titled - Non-Home Structure Fires By Equipment Involved In Ignition, states on page 7 line 224, that there were 333 fires on average per year started in Generators. The direct property damage cost, on average, $58,000,000.00 annually. This data was reported to U.S. Fire Department between 2007-2011 and was sourced from the National Fire Incident Reporting System.

Further information on fires originating in areas related to generators is found in the November 2016 NFPA document written by Marty Ahrens, titled - High-Rise Building Fires. The report states, on page 18, that 2% of all fires in high-rise buildings started in switchgear area or transformer vaults often associated with generators. Additionally, on page 18 machinery room or area or elevator machinery room which, by definition, includes generator rooms were responsible for 9% of all fires. There are other ignition sources mentioned in the report which potentially could also be associated with generators; for example, on page 23 in office high-rise buildings, 15% of fires were ignited via electrical distribution and lighting equipment.

Importance of generators

At almost a fire a day (333 fires on average per year), the damage caused by a generator fire has significant impact considering the critical nature of these generators to provide continued function of elevators, emergency lighting, life support systems, fire pumps, fire alarms, smoke control systems, and other services essential to life safety. Generators are required in many facilities and this proposal is only applicable to those facilities where generators are required.

Costs associated with a fire

Generator fires have a significant cost impact due to the presence of ignitable fuel being pumped under pressure. While the generator itself can cost upwards of several million dollars, loss of generator capability due to fire can result in loss of hundreds of millions of dollars if the facility is not able to function properly or to protect the life safety of occupants.

Solutions

Having an Alternative Automatic Fire-Extinguishing System (AAFES) in place using current technology provides for detection of a fire event at the early stages and rapid discharge of an extinguishing media to extinguish the fire prior to it causing significant damage to the generator itself or the building.

AAFES are shown to be the most effective solution for these unique fire hazards. Examples of AAFES specifically tested and listed for this type of hazard with the applicable listing/testing protocols include:

- Water Mist Systems per Factory Mutual Standard FM 5560
- Hybrid Systems per Factory Mutual Standard FM 5580
- Clean Agent Systems per Underwriters Laboratories Standard UL 2166 or UL 2167.

Additional effective alternatives include dry chemical, carbon dioxide, and foam.

Rapid detection and extinguishment of fire in a generator room by AAFES will allow the generator to get back into fully functional order quickly, minimize down time, business interruption, and protect building occupants.

Generator fires often involve ignition of ignitable liquids such as fuel oil or lubricating oil. Fires in such fuels can produce thick black smoke, severely limiting firefighter visibility. The use of AAFES to extinguish such fires by automatic means eliminates the need to expose firefighters to an extraordinarily high risk environment.

Bibliography: "High Rise Building Fires" Marty Ahrens, November, 2016, NFPA No. USS30 Copyright © 2016, National Fire Protection Association, Quincy, MA
"Non Home Structure Fires by Equipment by Equipment Involved in Ignition" John R. Hall, Jr., February, 2013, NFPA No. USS88 Copyright© 2013, National Fire Protection Association, Quincy, MA

Cost Impact: The code change proposal will increase the cost of construction
Cost estimates for material and labor to install four types of AAFES in a 9,240 cubic foot (40' X 15' X 15.4') generator room were generated. Average labor costs for the Greater New York City area based on prices effective in December 2020 were used in the estimates. The range of the cost estimates is $13,287 to $22,200 with the average estimated cost being $18,906.

Details of the cost estimates for the four systems are available at: https://spaces.hightail.com/space/F0QOHsHdwa

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