IFC

2021 GROUP A PUBLIC COMMENT AGENDA

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ICC
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2021 Public Comment Agenda

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F1-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

AUTOMATIC SPRINKLER SYSTEM. ~~An *automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.~~ An automatic sprinkler system is an integrated network of piping designed in accordance with fire protection engineering standards, commonly activated by heat from a fire and discharges water over the fire area, that consists of sprinklers, a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern.

2021 International Building Code

Revise as follows:

[F] AUTOMATIC SPRINKLER SYSTEM. ~~An*automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which *automatic* sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the *fire area*.~~ An automatic sprinkler system is an integrated network of piping designed in accordance with fire protection engineering standards, commonly activated by heat from a fire and discharges water over the fire area, that consists of sprinklers, a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern.

Reason: The definition of *automatic sprinkler system* is no longer consistent with the definition in the referenced standard. The definition in Section 202 aligns with the definition found in NFPA 13 (2010) which has been modified several times over past several revision cycles, e.g. 2013, 2016 and 2019 editions of NFPA 13. It is recommended to replace the definition for *automatic sprinkler system* with a definition consistent with the current edition of NFPA 13 (2019).
The importance of this change is to clarify that in a multiple story building, or a building having a footprint exceeding the area limitations of NFPA 13 for a single sprinkler system (52,000 sf or 40,000 sf), would be considered to have one system based on the definition included in Section 202; however, the building would be considered to have multiple systems based upon the definition in NFPA 13 (2019). For example, a 32-story high-rise building having a footprint area of 50,000 sf per floor would be considered as having a single sprinkler system based on the current definition included in Section of 202 while it would be considered as having 32 or more systems based on the definition included of NFPA 13 (2019). Similarly, in a single-story building having an area of 80,000 sf would be considered as having a single sprinkler system based on the definition in Section of 202 while it would be considered as having 2 or more systems based on the definition of NFPA 13 (2019).

The definition could also have an impact on the application of inspection, testing and maintenance requirements since NFPA 25 (2020 and prior eds.) provides system related requirements. Using the example above with respect to internal examination of sprinkler piping per system based on the 5 yr. requirement of NFPA 25. A 32-story high-rise building having a single sprinkler system could be interpreted as requiring four (4) internal examination points for the entire building while NFPA 25 would require four (4) internal examination points in sprinkler systems on alternating floors (e.g. 16 systems) resulting in 64 examination points.

It is recommended to replace the definition to allow for consistency between the *International Building Code* and its referenced standards to ensure consistency in application in all jurisdictions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Changing the definition does not affect the cost of construction.

F1-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that the proposal aligns the code definition with the referenced standard definition which the designers are currently using and it improves the code and makes it consistent with the standards. (Vote: 12-2)

F1-21

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION 202; IBC: SECTION 202

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

AUTOMATIC SPRINKLER SYSTEM .

An automatic sprinkler system is an integrated network of piping and fire sprinklers designed in accordance with fire protection standards.
~~An *automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.~~

2021 International Building Code

[F] AUTOMATIC SPRINKLER SYSTEM .

An automatic sprinkler system is an integrated network of piping and fire sprinklers designed in accordance with fire protection standards.
~~An *automatic sprinkler system*, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which *automatic* sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the *fire area*.~~

Commenter's Reason: The current and proposed definitions contain extraneous and incomplete text and are unnecessarily complicated. The alternative in this public comment eliminates "commonly..." "generally..." and other unnecessary text. It also clarifies that sprinkler standards may or may not be viewed as "engineering" standards. Whether they are or aren't isn't necessary to a definition and avoids legal questions regarding who may or may not be qualified to use such a standard.
I am a consultant to NFSA but this proposal is my own and is not submitted on NFSA's behalf

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No technical change to code application.

Public Comment# 2982

F8-21

Proposed Change as Submitted

Proponents: Tracie Dutter, Contra Costa County Fire Protection District, representing California Fire Chiefs Association

2021 International Fire Code

Add new definition as follows:

VALET WASTE.
A waste collection service that collects and removes the waste from the doorsteps of tenants.

304.1 Waste accumulation prohibited. Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

Add new text as follows:

304.1.1 Valet Waste.
Valet waste collection is prohibited.

Exception: Where *approved* by the *fire code official*.

Revise as follows:

~~**304.1.1**~~ **304.1.2 Waste material.** Accumulations of wastepaper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any type shall not be permitted to remain on a roof or in any *court*, yard, vacant lot, alley, parking lot, open space, or beneath a *grandstand*, *bleacher*, pier, wharf, manufactured home, recreational vehicle or other similar structure.

~~**304.1.2**~~ **304.1.3 Vegetation.** Weeds, grass, vines or other growth that is capable of being ignited and endangering property, shall be cut down and removed by the *owner* or occupant of the premises. Vegetation clearance requirements in wildland-urban interface areas shall be in accordance with the *International Wildland-Urban Interface Code*.

~~**304.1.3**~~ **304.1.4 Space underneath seats.** Spaces underneath *grandstand* and *bleacher* seats shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1-hour *fire-resistance-rated* construction in accordance with the *International Building Code*.

~~**304.1.3.1**~~ **304.1.4.1 Spaces underneath grandstands and bleachers.** Spaces underneath *grandstands* and *bleachers* shall not be occupied or utilized for purposes other than *means of egress* except where equipped with an *automatic sprinkler system* in accordance with Section 903.2.1.5.1, or separated with *fire barriers* and *horizontal assemblies* in accordance with Section 1030.1.1.1.

Reason: Valet waste collection services allow tenants, typically in R-2 occupancies, to place their trash and recyclables in the corridor outside their units to be picked up by a collection service, which comes by on a regularly scheduled basis.
This code change proposal would prohibit valet waste collection unless approved by the fire code official. There are currently no provisions in the IFC that specifically allow or prohibit valet waste; however, this code change proposal to prohibit valet waste is consistent with the current requirements of the IFC, including the following sections:

304.1: Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

304.2: Storage of combustible rubbish shall not produce conditions that will create a nuisance or a hazard to the public health, safety or welfare.

1031.2: Required exit accesses, exits and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the means of egress is occupied.

1031.3: A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.

1031.6: … Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof….

Valet waste collection will increase the amount of combustibles in corridors, which can lead to increased fires in corridors. Fires in corridors and the accumulation of combustibles impeding the path of egress through corridors can prevent tenants from safely exiting a building during a fire.

Valet waste will also have an impact on firefighters. Waste and collection containers will interfere with hose lines being pulled along corridors. Additionally, in limited visibility firefighters follow the wall to find their way. Waste and collection containers will create obstructions for firefighters attempting to follow the wall.

The fire code has long protected means of egress and provided for fire safety in buildings. We need to continue to protect means of egress, because when all else goes wrong, people must be able to get out of a building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact. The proposal is intended to provide clarification of the section requirements.

F8-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

VALET ~~WASTE~~ TRASH COLLECTION. A service that removes trash or recycling materials placed outside of dwelling units or sleeping units for collection ~~A waste collection service that collects and removes the waste from the doorsteps of tenants~~.

304.1.1 Valet trash ~~Waste~~. *Valet trash collection* shall only be permitted where *approved*. The *owner* and *valet trash collection* service provider shall comply with the rules and limitations established by the *jurisdiction*. ~~Valet waste collection is prohibited.~~

~~Exception:~~ ~~Where *approved* by the *fire code official*.~~

Committee Reason: The approval of this proposal was consistent with the actions taken on F236-21 and F237-21 as modified. The first modification revises the definition to be consistent with the modification to F236-21. The second modification rewords the proposed language to both make the owner responsible and provide the necessary language to give the jurisdiction the authority to allow or prohibit such services. The code is currently silent on the issue and provisions are necessary to address the hazard however is appropriate to the jurisdiction. Generally this proposal is intended to work together with the new appendix proposed by F236-21 and F237-21. (Vote: 13-1)

F8-21

Individual Consideration Agenda

Public Comment 1:

IFC: , 304.1.1

Proponents: Andrew Klein, representing Valet Living (andrew@asklein.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

VALET TRASH COLLECTION . ~~A~~ An intermediary service that removes trash or recycling materials placed outside of dwelling units or sleeping units for final collection.

304.1.1 Valet trash . The *fire code official* has the authority to establish a permitting requirement for the operation of *valet trash collection* services. ~~*Valet trash collection* shall only be permitted where approved. The *owner* and *valet trash collection* service provider shall comply with the rules and limitations established by the jurisdiction~~.

Commenter's Reason: After two cycles of debate, most code officials now agree that the Code does not prohibit the proven safe practice of valet trash removal from apartment occupancies. Fire inspectors in the field have asked dozens and dozens of times for just one thing: Put something in the Code that we can point to and use to prohibit the practice when it is not being performed safely.
Without a mention of valet trash collection, a jurisdiction that already has any of the 3 million apartment homes with the service will have no way of enforcing rules. as enforcement and adoption of the an appendix are two separate required steps.

Valet trash collection is the most popular and fastest-growing amenity and already in service at more than 15 percent of the nation's apartment homes. This PC provides a fire official with a great deal of authority over a proven low-risk, low-hazard common service that actually improves the fire safety of every building it is in by assuring the nightly removal of trash from the building.

In addition, the language as originally passed at the CAH could be taken as to prohibit regular private trash collection as is commonly thought of at

single family homes. This PC fixes the definition of "valet trash collection" to not include traditional trash collection at single family homes.

Furthermore, it is unreasonable for a model code to put the burden of establishing rules and limitations on a jurisdiction. “Jurisdiction,” as used by the code, refers to the adopting body. This gives the fire code official no authority over the rules and limitations that are set forth.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of the public comment and code change proposal will not increase or decrease the cost of construction This PC does not affect construction costs, but will have a positive effect on building valuations for resale.

Public Comment# 2716

Public Comment 2:

IFC:

Proponents: William Koffel, representing Affinity Waste Solutions (wkoffel@koffel.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

VALET TRASH COLLECTION . ~~A~~ An intermediary service that removes trash or recycling materials placed outside of dwelling units or sleeping units for final collection.

Commenter's Reason: The language as originally passed at the CAH could be taken as to prohibit regular private trash collection as is commonly thought of at single family homes. The Public Comment fixes the definition of "valet trash collection" to not include traditional trash collection at single family homes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The Public Comment simply modifies the definition approved during the CAH.

Public Comment# 2995

Public Comment 3:

Proponents: John Catlett, representing BOMA International (catlettcodeconsulting@gmail.com) requests Disapprove

Commenter's Reason: This proposal should have been vetted by the FCAC along with the other valet trash proposals, which received a year of consideration and debate before submission. It was not and was then the subject of specious testimony at the CAH. It will create what will practically be a ban on this legitimate business activity which occurs now in more than 15 percent of all apartment homes, is the most popular and fastest growing amenity in the industry and has never produced a single reported life-safety incident in 25 years of existence.
Door-step trash service also provides significant net operating income for apartment owners, having resulted to date in $10 billion of asset value creation nationwide. Allowing local fire officials to ban such a service would have an unintended deleterious effect on values and, as such, on their very own budgets. On average, a single valet trash building increases a taxable valuation of the property by $853,370.

In Riverside County, Calif., for instance, banning the service in just one building would cost their budget $8,107. In Lakewood, Colo., losing one valet trash building would cost $4,694 to the city budget in lost property taxes. Losing one building In Wayne County, Mich., would cost $20,054.
Please disapprove this proposal and send it back to the FCAC for a proper vetting for the next cycle.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2860

Public Comment 4:

Proponents: William Koffel, representing National Valet Trash and Recycling Valet Trash Association (wkoffel@koffel.com); Andrew Klein,

representing Valet Living (andrew@asklein.com) requests Disapprove

Commenter's Reason: The intent of F8-21 is to restrict a viable business model that is currently operating without adverse fire experience for over 25 years. It should be noted that there are inconsistencies within the Reason Statement for F8-21 that need to be addressed.
"Valet waste collection services allow tenants.....to place their trash and recyclables in the corridor...." It should be noted that nothing in the Code prohibits trash and recyclables being placed in a corridor today, with or without valet waste collection services. With the impact of COVID-19, many hotels have asked guests to place their trash in the corridor so that housekeeping does not need to enter the guest room. There are no restrictions on the construction or integrity of the containers unless the containers exceed 40 gallons or are in specific occupancies address in Section 808. Even before COVID-19, I would see trash placed outside the doors of hotel rooms and timeshare units by occupants who did not want the trash in their room or were too lazy to carry the trash to the trash collection room.

"Valet waste collection will increase the amount of combustibles in corridors...." While a true statement, what is the increase in risk? The limitation on container size along with the removal of the combustibles from the corridor present less of a risk than what can commonly be found in corridors without restriction (upholstered furniture, ash receptacles, etc). The provisions that have been put forth by the industry and the FCAC all require that the required egress width be maintained which means the combustibles themselves will not be an impediment to egress.

The above argument also totally ignores the amount of combustibles within the dwelling unit which is where most fatal fires originate. Is it possible that the convenience of valet waste services will reduce the combustible load within dwelling units, encourage people to more quickly dispense of trash and waste (due to the limited container size), and therefore reduce the risk to occupants within a dwelling unit?

"Valet waste will also have an impact on firefighters." Having fire service experience, I have dealt with fire scenarios in which items are in the corridor. Yes, I too received training to "follow the wall." However, what about other items that are permitted to be in the corridor that also would not allow me to maintain constant contact with the wall?

This issue has been put before the legislature in several states, and generally the legislatures have approved valet trash collection. Do we really want the state legislatures to make these decisions and write the requirements or will everyone be better served to have fire protection professionals write a reasonable set of requirements that address all the issues? The Committee approved as modified F236-21 and F237-21 as a new Appendix O. The Code would be inconsistent to then also include a restriction on valet trash collection and require the industry to approach each and every jurisdiction to gain approval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
While the cost of construction will not be impacted the market value of properties will be impacted significantly by the Public Comment (favorably) and by the Code Change Proposal (negatively).

Public Comment# 2896

F9-21

Proposed Change as Submitted

Proponents: Tim Earl, representing GBH International (tearl@gbhinternational.com)

2021 International Fire Code

Revise as follows:

304.3 Containers. ~~Combustible~~ Containers for combustible rubbish and waste material ~~kept~~ located within or near a structure shall ~~be stored in accordance~~ comply with Sections 304.3.1 through 304.3. 7~~4~~.

Add new text as follows:

304.3.2 Low heat release materials.
Where required by this section, low heat release materials shall exhibit a peak rate of heat release not exceeding 300 kW/m2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

Revise as follows:

~~**304.3.2**~~ **304.3.3 Capacity exceeding 5.33 cubic feet.** Containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) shall be provided with lids. Containers and lids shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. ~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

~~Exception:~~ ~~Wastebaskets complying with Section 808.~~

304.3.4 Capacity of 1 cubic yard or more. Dumpsters with an individual capacity of 1.0 cubic yard [200 gallons (0.76 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the dumpsters are constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2.~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.~~

Exceptions:

1. Dumpsters in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.

~~**304.3.3**~~ **304.3.5 Capacity exceeding 1.5 cubic yards.** Dumpsters and containers with an individual capacity of 1.5 cubic yards [40.5 cubic feet (1.15 m^3)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.

Exceptions:

1. Dumpsters or containers that are placed inside buildings in areas protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.
3. Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an *approved automatic sprinkler system*.

Add new text as follows:

304.3.6 Waste and linen containers in Group I-1, I-2, and I-3 occupancies and Group B ambulatory care facilities.
Waste and linen containers located in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. 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 of the International Building Code.

Exception: Recycling containers complying with Section 304.3.6.2 are not required to be stored in waste and linen collection rooms.

304.3.6.1 Capacity Density.
The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).

304.3.6.2 Recycling clean waste containers.
Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

304.3.7 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories.
Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20gallons (75.7 L) or more, shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. 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 constructed in accordance with Table 509 of the International Building Code.

Revise as follows:

808.1 ~~Wastebaskets and l~~ Linen containers in Group I-1, I-2 and I-3 occupancies and Group B ambulatory care facilities. ~~Wastebaskets, l~~ 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 comply with Section 304.3.6 ~~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.~~

Delete without substitution:

~~**808.1.1 Capacity density.**~~
~~The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).~~

~~**808.1.2 Recycling clean waste containers.**~~
~~Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).~~

~~**808.2 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories.** Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20 gallons (75.7 L) or more, 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 constructed in accordance with Table 509.1 of the International Building Code.~~

Reason: The intent of this proposal is to clean up the requirements for waste containers and make them easier for users to find. Specifically:

- It eliminates some duplication between sections 304 and 808.
- It places all requirements for waste containers in Chapter 3, where they belong. When asked, code officials told me they wouldn't go looking for waste container requirements in the chapter on Interior Finish, Decorative Materials, and Furnishings. (Waste containers are none of those things). One code official stated that they didn't even know there were waste container requirements in Chapter 8.
- The heat release requirements are restated several times in different places, so I created a new label (low heat release materials) and then reference it in where applicable.
- 304 was reordered in size order, since the current language goes from small to large to medium.
- A pointer was left in 808 for linen containers, since they're not really waste containers.

Again, there are no technical changes in this proposal. It is a reorganization to make the code more user friendly. The intent is to bring more visibility to these requirements, which are often overlooked.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a reorganization of information with no impact on cost.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that it makes sense to locate and consolidate these requirements in Chapter 3 and the improvement of having the test specifications in one section that can be pointed to. (Vote: 12-2)

F9-21

Individual Consideration Agenda

Public Comment 1:

IFC: 304.3.6, 304.3.6.1, 304.3.6.2, 304.3.7, 808.1

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

304.3.6 Waste and linen containers in Group I-1, I-2, and I-3 occupancies and ~~Group B~~ ambulatory care facilities . Waste and linen containers located in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. 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 waste and linen 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 of the International Building Code.

Exception: Recycling clean waste containers complying with Section 304.3.6.2 are not required to be stored in waste and linen collection rooms.

304.3.6.1 Capacity Density . The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).

304.3.6.2 Recycling clean waste containers . Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

304.3.7 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories . Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20gallons (75.7 L) or more, shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. 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 waste containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste ~~and linen~~ collection room constructed in accordance with Table 509 of the International Building Code.

808.1 Waste and linen ~~Linen~~ containers in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities . Waste and linen ~~Linen~~ containers located in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall comply with Section 304.3.6 .

Commenter's Reason: In Section 808.1, the proposal removed the requirement for waste containers in this pointer. The Healthcare committee does not object to the move, but both types of containers need to remain to match federal licensure requirements.
This modifications also provides for consistent language throughout this section. The current text uses containers and wastebaskets – which leads to the question if there is a difference intended. In Section 304.3.7, there are no requirements for linen collections. Removing 'Group B' in the text is consistent with G3-21 which was approved for IBC, IFC, IPC and IMC. 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'.

This public comment is submitted by the Committee on Healthcare (CHC).

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 and 2021 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 net effect of the public comment and code change proposal will not increase or decrease the cost of construction This is a reorganization of information with no impact on cost.

Public Comment# 2614

F12-21

Proposed Change as Submitted

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

309.2 ~~Use in hazardous (classified) locations~~ Listing. Fuel powered industrial trucks shall be *listed* in accordance with UL 558. Electric battery-powered industrial trucks shall be *listed* in accordance with UL 583. Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with NFPA 70 shall be *listed* and *labeled* for use in the environment intended in accordance with NFPA 505.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

558-2012	Standard for Industrial Trucks, Internal Combustion Engine-Powered
583-2012	Electric-Battery-Powered Industrial Trucks

Reason: This proposal adds a listing requirement for industrial trucks to ensure equipment used and regulated by the IFC is evaluated for safety in accordance with published standards. This would be consistent with OSHA requirements. There are many industrial trucks currently certified (listed) under both proposed new reference standards.

Cost Impact: The code change proposal will increase the cost of construction
The proposal has the potential to increase the cost of powered industrial trucks, although many of these are already listed in accordance with the standards referenced.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 558-2012: Standard for Industrial Trucks, Internal Combustion Engine-Powered
- UL 583-2012: Electric-Battery-Powered Industrial Trucks

F12-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were the specifics of this section are for hazardous locations and by adding in criteria that is just generic is inappropriate for this to go in this location and in addition the current referenced standard NFPA 505 lists NFPA 583 and NFPA 558 as reference standards within it so it would be redundant to add them. (Vote: 12-1)

F12-21

Individual Consideration Agenda

Public Comment 1:

IFC: 309.2,

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

309.2 Listing . ~~Fuel powered~~ Powered industrial trucks ~~shall be *listed* in accordance with UL 558. Electric battery-powered industrial trucks shall be *listed* in accordance with UL 583. Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with NFPA 70~~ shall be *listed* and *labeled* for use in the environment intended in accordance with NFPA 505.

,

~~558-2012 Standard for Industrial Trucks, Internal Combustion Engine-Powered~~

,

~~583-2012 Electric-Battery-Powered Industrial Trucks~~

Commenter's Reason: Regardless of where used, powered industrial trucks should be listed and labeled for use in the environment intended in accordance with NFPA 505. The scope of NFPA 505 is for all environments. The standards UL 558 and UL 583 are included within NFPA 505, and address the associated hazards for both internal combustion engine powered (such as LP gas, gasoline, diesel, and CNG) and electric battery powered (such as lithium ion)

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This NFPA standard is already in use so there will be no cost impact.

Public Comment# 2687

F15-21 Part I

Proposed Change as Submitted

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

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Fire Code

Add new definition as follows:

LANDSCAPED ROOF. An area on a roof incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of a roof assembly.

VEGETATIVE ROOF. A roof assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

Revise as follows:

SECTION 317
VEGETATIVE ~~LANDSCAPED~~ ROOFS

317.1 General. Vegetative ~~Landscaped~~ roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.15 of the International Building Code and be installed and maintained in accordance with Sections 317.2 through 317.5.

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

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

905.3.8 Landscaped or vegetative roofs. Buildings or structures that have landscaped or vegetative roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the landscaped or vegetative roof is located.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where roofs are used for landscaped roofs , vegetative roofs or for other purposes, stairways shall be provided as required for such occupancy classification.

Reason: This is an editorial proposal covering both the IFC and the IBC to consistently use the term "vegetative roof".
The term "landscaped roofs" has been used by the public interchangeably with "vegetative roofs". This has created confusion in the building code and conflicts with industry standards that have coalesced around the term "vegetative roof". . Moreover, some of the sections presently identified as "landscaped roofs" should refer to "vegetative roofs" as they really addresses roofs that are part of the building envelope and, thus, are associated with the existing definition of "vegetative roofs". In these locations, the code is revised to properly use "vegetative roof". In other places, both terms are retained as the language could apply either to a vegetative roof where the membrane, growth medium and vegetation are incorporated as part of the roof assembly, or a landscaped roof where planters, hardscapes, or other features are provided above the roof assembly and not integrated into it. A definition for "landscaped roof" is proposed to capture such features and better distinguish between a true "vegetative roof" as defined in the IBC and industry standards.

Neither the IFC nor the IBC define the term "landscaped roof", but the IBC does contain a definition for the term "vegetative roofs" that reads as follows.

[BS] VEGETATIVE ROOF. *An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.*

This proposal also copies the existing definition from the IBC to the IFC.

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

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as 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 proposal is editorial and will not impact how vegetative and landscaped roofs are designed and constructed.

F15-21 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reasons for approval were that it cleans up the language and makes it consistent and the previous action on Part II by the IBC FS committee. (Vote 14-0)

F15-21 Part I

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION 202, SECTION 317, 317.1, 317.2, 317.4.3, 905.3.8, 504.3

Proponents: Chadwick Collins, representing Protected Membrane Roofing Institute (ccollins@kellencompany.com); John Woestman, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

LANDSCAPED ROOF . An area ~~on~~ over a roof assembly incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of ~~a~~ the roof assembly.

VEGETATIVE ROOF . A roof assembly of interacting components designed to waterproof a building's top surface that includes, by design, ~~vegetation and related landscape elements.~~ a vegetative surface.

SECTION 317
VEGETATIVE AND LANDSCAPED ROOFS

317.1 General . Vegetative roofs and landscaped roofs shall comply with Sections 1505 and 1507.15 of the International Building Code and be installed and maintained in accordance with Sections 317.2 through 317.5.

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

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

905.3.8 ~~Landscaped or vegetative roofs~~ Vegetative roof and Landscaped roof standpipe systems . Buildings or structures that have

landscaped roofs or vegetative roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the landscaped roof or vegetative roof is located.

504.3 Stairway access to roof . New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where ~~roofs are used for landscaped roofs, vegetative roofs or~~ the roof is a vegetative roof, includes a landscaped roof area, or is used for other purposes, stairways shall be provided as required for such occupancy classification.

Commenter's Reason: This public comment adds clarity to the definitions in the original proposal. The original definitions contradicted themselves by saying that a Landscape Roof was not part of a roof assembly only to have the Vegetative Roof definition included it as part of its assembly. This clarifies the intent of the proposal and will prevent interpretation issues in the field.
Coordinating terminology changes were made to the subsequent sections to appropriately include Vegetative Roofs and Landscaped Roofs and avoid any further misinterpretations.

This proposal coordinates with F15 part 2.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The changes made in the original proposal and public comment do not affect the cost of construction. The modifications only clarifies the intent of the language.

Public Comment# 2332

F15-21 Part II

Proposed Change as Submitted

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

2021 International Building Code

Add new definition as follows:

LANDSCAPED ROOF. An area on a roof incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of a roof assembly.

Revise as follows:

[BS] VEGETATIVE ROOF. A roof ~~An~~ assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

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

[BF] 1507.15.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed on the roof by the *vegetative roof* or landscaped roofs shall comply with the fire resistance rating requirements of Table 601.

Reason: This is an editorial proposal covering both the IFC and the IBC to consistently use the term "vegetative roof".
The term "landscaped roofs" has been used by the public interchangeably with "vegetative roofs". This has created confusion in the building code and conflicts with industry standards that have coalesced around the term "vegetative roof". . Moreover, some of the sections presently identified as "landscaped roofs" should refer to "vegetative roofs" as they really addresses roofs that are part of the building envelope and, thus, are associated with the existing definition of "vegetative roofs". In these locations, the code is revised to properly use "vegetative roof". In other places, both terms are retained as the language could apply either to a vegetative roof where the membrane, growth medium and vegetation are incorporated as part of the roof assembly, or a landscaped roof where planters, hardscapes, or other features are provided above the roof assembly and not integrated into it. A definition for "landscaped roof" is proposed to capture such features and better distinguish between a true "vegetative roof" as defined in the IBC and industry standards.

Neither the IFC nor the IBC define the term "landscaped roof", but the IBC does contain a definition for the term "vegetative roofs" that reads as follows.

[BS] VEGETATIVE ROOF. *An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.*

This proposal also copies the existing definition from the IBC to the IFC.

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

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as 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 proposal is editorial and will not impact how vegetative and landscaped roofs are designed and constructed.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded the proposal coordinates the proper terminology. The proposal covers both the IFC and the IBC to use the term “vegetative roof" consistently”. (Vote: 13-0)

F15-21 Part II

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202

Proponents: Chadwick Collins, representing Protected Membrane Roofing Institute (ccollins@kellencompany.com); John Woestman, representing Extruded Polystyrene Foam Association (jwoestman@kellencompany.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

LANDSCAPED ROOF . An area ~~on~~ over a roof assembly incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of ~~a~~ the roof assembly.

[BS] VEGETATIVE ROOF . A roof assembly of interacting components designed to waterproof a building’s top surface that includes, by design, ~~vegetation and related landscape elements.~~ a vegetative surface.

Commenter's Reason: This public comment adds clarity to the definitions in the original proposal. The original definitions contradicted themselves by saying that a Landscape Roof was not part of a roof assembly only to have the Vegetative Roof definition included it as part of its assembly. This clarifies the intent of the proposal and will prevent interpretation issues in the field.
This proposal coordinates with F15 part 1.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The changes made in the original proposal and public comment do not affect the cost of construction. The modifications only clarify the intent of the language.

Public Comment# 2763

Public Comment 2:

IBC: [BF] 1505.10

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, representing ICC Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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

Commenter's Reason: Proposal F16 Part II was approved as submitted and contains the language proposed in this public comment for section 1505.10. The language in F16 part II is the correct one because the fire test needs to apply to all types of roofs (and that is covered by 1505.1 and 1507.16) while the SPRI standard covers installation but only for vegetative roofs.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is still editorial and corrects an error in the original proposal.

F18-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

105.5.32 Mobile food preparation vehicles. An operational permit is required for mobile food preparation vehicles equipped with appliances that produce smoke or grease-laden vapors.

319.1 General. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors for the purpose of preparing, cooking, or serving food shall comply with NFPA 96 and this section. Indoor use of mobile food preparation vehicles is prohibited unless approved by the fire code official.

319.2 Permit required. Permits shall be required as set forth in Section 105.5.

319.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood constructed in accordance with Section 606.

319.4 ~~Fire protection.~~ Maintenance. ~~Fire protection shall be provided in accordance with Sections 319.4.1 and 319.4.2.~~
Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.4.1 through 319.4.3.

319.4.1 ~~Fire protection for cooking equipment~~ Exhaust System. ~~Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.~~
The exhaust system, including hood, grease-removal devices, fans, ducts, and other appurtenances, shall be inspected and cleaned in accordance with NFPA 96.

319.4.2 ~~Fire extinguisher~~ Fire protection systems and devices. ~~Portable fire extinguishers shall be provided in accordance with Section 906.4.~~
Fire protection systems and devices shall be maintained in accordance with Section 901.6.

319.4.3 Fuel gas systems. Fuel gas systems shall be maintained in accordance with 319.4.3.1 through 319.4.3.4.

319.4.3.1 LP-gas systems. LP-gas containers installed on the vehicle and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.2 CNG systems. CNG containers and fuel gas piping systems shall be inspected annually by an approved inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

319.4.3.3 Annual leakage test. All fuel gas piping systems and appliances shall be checked annually for leakage at the operating pressure of the system using a manometer or pressure gauge. Where leakage is indicated, the gas supply shall be turned off until repairs have been made and the system no longer leaks.

319.4.3.4 Inspection tag. Upon a satisfactory annual inspection, the approved inspection agency, person or special expert shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of the satisfactory inspection.

319.5 ~~Appliance connection to fuel supply piping~~ Manual system operation for the automatic fire extinguishing system(s). ~~Gas cooking appliances shall be secured in place and connected to fuel supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.~~
A manual activation device shall be provided for the automatic fire extinguishing system(s) provided for the cooking appliance(s). The manual activation device shall be unobstructed and in view from the means of egress, located at or near a means of egress from the cooking area, and at a location acceptable to the fire code official. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the walking surface of the means of egress and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

~~319.6 Cooking oil storage containers.~~ ~~Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.~~

~~319.7 Cooking oil storage tanks.~~ ~~Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections 319.7.1 through 319.7.5.2.~~

~~319.7.1 Metallic storage tanks.~~ ~~Metallic cooking oil storage tanks shall be *listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.~~

Delete without substitution:

319.7.2 Nonmetallic storage tanks.
Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:

1. Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

Revise as follows:

319.7.3 Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.7.4 Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

319.7.5 Tank venting. Normal and emergency venting shall be provided for cooking oil storage tanks.

319.7.5.1 Normal vents. Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

319.7.5.2 Emergency vents. Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

319.8 LP-gas systems. Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.

319.8.1 Maximum aggregate volume. The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.

319.8.2 Protection of container. LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

319.8.3 LP-gas container construction. LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

319.8.4 Protection of system piping. LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

319.8.5 LP-gas alarms. A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.

319.9 CNG systems. Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections 319.9.1 through 319.9.4.

319.9.1 CNG containers supplying only cooking fuel. CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections 319.9.1.1 through 319.9.1.3.

319.9.1.1 Maximum aggregate volume. The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.

319.9.1.2 Protection of container. CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

319.9.1.3 CNG container construction. CNG containers shall be an NGV-2 cylinder.

319.9.2 CNG containers supplying transportation and cooking fuel. Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

319.9.3 Protection of system piping. CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.

319.9.4 Methane alarms. A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

319.10 Maintenance. Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.10.1 through 319.10.3.

319.10.1 Exhaust system. The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.

319.10.2 Fire protection systems and devices. *Fire protection systems* and devices shall be maintained in accordance with Section 901.6.

~~**319.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel gas piping systems shall be inspected annually by an *approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.~~

904.2.2 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Sections 606 and 319 to have a Type I hood shall be protected with an *approved* automatic fire-extinguishing system installed in accordance with this code.

904.13.1 Manual system operation. A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

~~Exception~~ Exceptions:

1. *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.
2. *Mobile food preparation vehicles* in accordance with Section 319.

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, ~~and~~ S occupancies~~.~~ and mobile food preparation vehicles in accordance with Section 319.

   Exceptions:

   1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
   2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
   3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

      3.1. Use of vehicle-mounted extinguishers shall be *approved* by the *fire code official*.

      3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket *approved* by the extinguisher manufacturer or the *fire code official* for vehicular use.

      3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.

      3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

      3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where *flammable* or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3316.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

Reason: The overarching application of NFPA 96 to this code section provides for a cohesive and systemic code proposal, clarification and consistency of application. However, specifically with respect to maintenance of the fire protection systems, the 2021 edition of NFPA 96, Sections 12.2.1 and 12.2.1.1 exempts maintenance of the fire protection systems. In order to ensure that maintenance to address the exhaust system is still required, the existing code section for maintenance is retained. Note that the maintenance to address the exhaust system is still referenced from NFPA 96. However, the existing requirement to maintain the fire protection system is retained without change, to ensure that this maintenance

continues. Additionally, details are added to the criteria for maintenance of fuel gas systems, such as the criteria for an annual leakage test. For clarity to the users, the maintenance criteria for fuel gas systems is reformatted into subsections.
The proposal also includes a specific section to address manual system operation of the extinguishing system. The section is modeled after existing IFC Section 904.12. However, in many cases, the expected separation distance from cooking appliances to the manual actuation device will not be in compliance with the 10-20 feet separation criteria found in Section 904.12. As such, the proposal is to eliminate the specific distance criteria and instead provide performance criteria for the device to be unobstructed, in view from the means of egress, and located at or near the means of egress from the cooking area, subject to approval by the fire code official. This type of code language for placement of the manual activation device is similar to how this topic is treated in the 2021 edition of NFPA 96, Section 11.4. The proposal is added to the IFC to clarify how placement of these devices can differ from those of permanent installations within buildings, which are still governed by the overall criteria of IFC Section 904.12. To clarify the intent for the user, an exception is proposed for Section 904.12.1, so that the separation distance of 10-20 feet does not apply to mobile food preparation vehicles.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code proposal will not have an impact to the cost of construction as the intent of the code change is to provide clarity and consistency of application and enforcement.

F18-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that NFPA 96 is the appropriate referenced standard and that committee has the expertise to really address all the issues that were heard in testimony. It was noted to be a very comprehensive standard and the place that the inspectors need to go for all the requirements for these systems. Finally, it was stated that mobile food trucks are very complex, and they are best dealt with now in the standard that involves all the experts for how these systems are designed, installed, operated, maintained and tested. Thus, as stated, the correct pointer is to NFPA 96. (Vote: 9-5)

F18-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org) requests Disapprove

Commenter's Reason: The adoption of NFPA 96 to for mobile food vehicles will create much confusion to the users of the IFC. With the adoption, as proposed, significant conflicts will be created between the IFC and what is within the proposed standard. These include:
1. The title of the chapter in NFPA 96 "Additional Provisions for mobile...." indicates the application is the entire document. How are the conflicts between NFPA 96 and the IMC (still proposed to remain by the reference to IFC Section 606) handled?

2. How is the certain electric-only cooking appliances allowed by the IMC permitted to be used without a hood (just like inside a building)?

3. How are transient-style trucks, like lunch and coffee "wagons" handled that travel from site-to-site, when NFPA 96 requires them to be on jacks or otherwise supported?

4. How are small LPG appliances handled since NFPA 96 requires ASME tested tanks instead of common DOT cylinders?

We feel that there is much work to be done on this topic for both technical and permitting prior to the inclusion of NFPA 96. The IFC committee has an established committee of not adopting NFPA 96 as a standard for inspections since it felt that operational and maintenance provisions should be

best aligned with the IMC (through Section 606) and the fire-suppression requirements in Section 904.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction This is an operational provision.

Public Comment# 2969

F20-21

Proposed Change as Submitted

Proponents: Daniel Nichols, Metropolitan Transportation Authority, Construction and Development, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Revise as follows:

319.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with ~~Section 606~~ the *International Mechanical Code*.

319.4.1 Fire protection for cooking equipment. Cooking equipment required to have a Type I hood shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

319.8 ~~319.7.3~~ Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.8.1 ~~319.7.4~~ Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

Reason: The purpose of this code change is to better align the requirements within the section with that of a fixed commercial kitchen; including addressing requirements that are more restrictive.
Exhaust Hood- There is a difference of triggering events between the Fire Code and Mechanical Code on what requires a Type I hood. Under IMC 507, certain light-duty appliances and smokers with integrated exhaust are exempted. This makes the requirements for a mobile food truck more restrictive than a commercial kitchen within a new building.

Fire suppression system- The barometer of the hazard caused by grease laden vapors is dependent on the need for a Type I hood in the IMC, specifically recognized in IMC Section 509. The current language does not take into account the coverage of a Type I hood. Therefore, any vehicle that is regulated by this section is required to have all cooking equipment protected by a fire suppression system, regardless of duty level, output type or hazard.

System Components and Design Criteria- These sections are not part of the "tank" and are only being moved to ensure they are considered separately.

Cost Impact: The code change proposal will decrease the cost of construction
By limiting the applicability of ventilation and fire suppression requirements to that of fixed commercial kitchens, the hazard protection remains comparable while decreasing the cost of building a mobile food truck.

F20-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were based on the action on F18-21 and the requirements are already in the code and the proposed language is not necessary. (Vote: 13-1)

F20-21

Individual Consideration Agenda

Public Comment 1:

IFC: 319.3, 319.4.1, 319.8 , 319.8.1

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

319.3 Exhaust hood . Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with ~~the~~ Section 606 ~~with~~ and the *International Mechanical Code*.

319.4.1 Fire protection for cooking equipment. Cooking equipment required to have a Type I hood by Section 606 shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

319.8 Cooking oil storage system components . Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

319.8.1 Design criteria . The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

Commenter's Reason: As an alternative to the adoption of NFPA 96 in F18-21, this provides a couple needed improvements to the section. The committee rejected it in favor of F18 but feel the requirements should still remain within the IFC. The original proposal substantiation still applies.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Operational Issue

Public Comment# 2970

F23-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

SECTION 321
~~ARTIFICIAL COMBUSTIBLE VEGETATION~~ COMBUSTIBLES ON ROOFS AND NEAR BUILDINGS

321.1 Artificial combustible vegetation on roofs and near buildings. Artificial combustible vegetation exceeding 6 feet (1829 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 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

Add new text as follows:

321.2 Combustible Furniture on Roofs.
Combustible furniture permanently installed on roofs shall comply with any one of the following, unless exempted by Section 321.4:

1. The combustible product shall be constructed entirely of materials that exhibit a flame spread index not exceeding 200, in accordance with Section 803.1, and/or of noncombustible materials.
2. The combustible product shall be constructed entirely of materials that exhibit a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, and/or of noncombustible materials.
3. The entire combustible product item shall exhibit a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source.

321.3 Other Combustibles on Roofs.
The requirements of Section 321.2 shall apply also to combustible products permanently installed on roofs if they have either comparable mass or comparable fuel content to that of permanently installed furniture.

321.4 Distance exception.
The requirements of Section 321.2 shall not apply if the combustible product is installed at a distance of not less than 10 feet (3048 mm) from another combustible product or from an opening.

Reason: This is a companion proposal to one that addresses heavy combustible furniture, and other combustible products of similar mass or fuel content, permanently installed near buildings. This proposal extends the concept contained in the existing section dealing with combustible vegetation.
The fire safety requirements for the furniture on roofs is the same as for the proposal for furniture and other combustibles near buildings. The background for this particular proposal is the fire on a roof of the Cosmopolitan Hotel in Las Vegas on July 2015.

Research has shown that plastic benches can generate very high heat releases. ATF conducted tests on several plastic lumber benches simulating an actual incident. In the incident, a plastic lumber bench attached to a brick wall, from the outside, at a school and under an overhang, was ignited with a small ignition source (child's coat) and the entire school was destroyed soon after ignition. Tests conducted by GBH International showed that a Southern Yellow Pine (standard park bench lumber) would have performed much better and that even some plastic lumber materials could have done much better. The maximum heat release rate of plastic lumber bench ignited in this type of scenario is very high and can be above 4 MW, while the wood bench performed adequately.

The requirements do not apply if the combustible product is far away from any other combustible product or from an opening.

Four photographs are shown below, and the same ones have been added to the proposal on furniture near buildings:

First photograph shows the effect of a plastic bench just a few minutes after ignition of a small coat on the bench.

The second photograph shows the same bench just before it had to be manually extinguished.

The third photograph shows the effect of a wood bench ignited the same way, with the flames causing minimal damage.

The fourth photograph shows the wood bench after the fire stopped (no manual extinguishment needed).

Cost Impact: The code change proposal will increase the cost of construction
Combustible furniture will have to be fire tested.

F23-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was consistent with the action on F22-21, which had similar reasons for disapproval. (Vote: 14-0)

F23-21

Individual Consideration Agenda

Public Comment 1:

IFC: 321.1, 321.2, 321.3, 321.4

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

321.1 Artificial combustible vegetation on roofs and near buildings . Artificial combustible vegetation exceeding 6 feet (1829 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 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

321.2 ~~Combustible Furniture~~ Park Benches on Roofs . Park benches shall not be permitted to be located on roofs unless they comply with either one of the following.
~~Combustible furniture permanently installed on roofs shall comply with any one of the following, unless exempted by Section 321.4:~~

1. ~~The combustible product shall be constructed entirely of materials that exhibit a flame spread index not exceeding 200, in accordance with Section 803.1, and/or of noncombustible materials.~~ The park bench shall be constructed entirely of wood or noncombustible materials.
2. ~~The combustible product shall be constructed entirely of materials that exhibit a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354, at an incident heat flux of 50 kW/m2 in the horizontal orientation, and/or of noncombustible materials.~~ The park bench shall be constructed entirely of materials that exhibit 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.
3. ~~The entire combustible product item shall exhibit a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source.~~

Exception. Section 321.2 shall not apply if the park bench is located at a distance of not less than 10 feet (3048 mm) from an unprotected opening.

~~321.3 Other Combustibles on Roofs~~ . ~~The requirements of Section 321.2 shall apply also to combustible products permanently installed on roofs if they have either comparable mass or comparable fuel content to that of permanently installed furniture.~~

~~321.4 Distance exception exception~~ . ~~The requirements of Section 321.2 shall not apply if the combustible product is installed at a distance of not less than 10 feet (3048 mm) from another combustible product or from an opening.~~

Commenter's Reason: Note that combustible park benches can cause a much more severe fire than combustible artificial vegetation, which is regulated now on roofs.
The committee and testifiers pointed out that the fire hazard of large combustible products, like park benches, is the same whether they are just located on a roof or permanently installed. Therefore, this public comment addressed the issue of permanently installed by replacing it with "located". The public comment also simplified the requirements and restricted them only to park benches.

The heat release requirements (using ASTM E1354) are the same as those for large waste containers throughout the IFC.

The proposal does not address permits just like the existing section on combustible artificial vegetation does not address permits and has been in the code for at least one cycle.

If someone wants to put a wood bench on the roof everything is OK. If a plastic bench is to be used, there needs to be documentation that it is low heat release.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Plastic park benches on roofs will have to be fire tested.

Public Comment# 2406

F25-21

Proposed Change as Submitted

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

2021 International Fire Code

CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

Add new definition as follows:

POWERED MICROMOBILITY DEVICES.
Motorized bicycles, motorized scooters and other personal mobility devices powered by a lithium-ion or lithium metal battery. The term does not include motor vehicles that are required to be registered with the Department of Motor Vehicles for the state or jurisdiction

CHAPTER 3
GENERAL REQUIREMENTS

Add new text as follows:

SECTION 322
POWERED MICROMOBILITY DEVICES

322.1 General.
Lithium-ion and lithium metal battery *powered micromobility devices* shall be operated and maintained in accordance with this section.

Exceptions:

1. Storage, repair and charging in residential occupancies of not more than 5 battery *powered mobility devices* , provided that such devices are for personal use by its owner.
2. Charging of a single *powered mobility device* in any occupancy by its owner.

322.1.1 Prohibited locations.
The use of a residential occupancy as a business for the charging of commercially owned *powered mobility devices* as part of a rental or sales service shall not be permitted.

322.2 Battery chargers and equipment.
Powered micromobility devices shall be charged in accordance with their listing and the manufacturer's instructions using only the original equipment manufacturer-supplied charging equipment or charging equipment in accordance with the listing and manufacturer's instructions.

322.3 Listing.
Powered micromobility devices shall be listed and labeled in accordance with UL 2272 or UL 2849, as applicable.

322.4 Battery charging areas.
Where approved, *powered micromobility devices* shall permitted to be charged in a room or area that complies with all of the following:

1. Only listed devices utilizing listed charging equipment shall be permitted to be charged.
2. Is provided with sufficient electrical receptacles to allow the charging equipment for each device to be directly connected to a receptacle. Extension cords and relocatable power taps shall not be used.
3. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted.
4. The charging operation shall not be conducted in or obstruct any required means of egress.
5. Removable storage batteries shall not be stacked or charged in an enclosed cabinet unless the cabinet is specially designed and approved for such purpose.
6. A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations unless each battery is isolated from neighboring batteries by an approved fire-resistant material.

7. A minimum of 18 inches (457.2 mm) shall be maintained between each powered *micromobility* devices during charging operations.
8. The indoor room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection.

322.5 Fire safety plan.
A fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

CHAPTER 80
REFERENCED STANDARDS

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

UL 2272-2016	Electrical Systems for Personal E-Mobility Devices
UL 2849-2020	Electrical Systems for eBikes

Reason: There has been a significant increase in the use of micromobility devices in the past few years and the improper charging of these devices can lead to a thermal runaway incident. There have been significant fires due to these devices including a recent 4 alarm fire in NYC. This proposal sets reasonable safety requirements for the indoor charging of these devices with lithium-ion and lithium metal type batteries. Requirement for the listing of the device and the associated charging equipment that is compatible with the device and its battery is also a critical safety requirement. There is a clear prohibition of utilizing a residential occupancy for operating a rental, sales and service business for these devices, an occurrence fire departments have reported.

Cost Impact: The code change proposal will increase the cost of construction
This will increase the cost of construction because of the requirements for the proper number of electrical receptacles and the requirement for a fire detection system.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.
- UL 2272-2016: Electrical Systems for Personal E-Mobility Devices
- UL 2849-2020: Electrical Systems for eBikes

Note that proposed Section 322.5 refers to proposed Section 403.10.6 within proposal F28-21.

F25-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that although there is need for requirements for these devices, they had multiple concerns with the proposal. These included the exception for not more than five battery powered mobility devices, which was noted to be unenforceable in a residential occupancy and also would technically prohibit more than five tenants in a multifamily building renting micro mobility devices. Other concerns included the device name difference between the proposed section and the referenced standard and the restriction on the charging equipment and 18-inch distance during charging operations. (Vote: 8-6)

Staff Analysis: Note that proposed Section 322.5 refers to proposed Section 403.10.6 within proposal F28-21.

F25-21

Individual Consideration Agenda

Public Comment 1:

IFC: 322.1, 322.4

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

322.1 General . Lithium-ion and lithium metal battery *powered micromobility devices* shall be operated and maintained in accordance with this section.

Exceptions:

1. Storage, repair and charging in residential occupancies of ~~not more than 5 battery battery~~ *powered mobility devices*, provided that such devices are for personal use by its owner.
2. Charging of a single *powered mobility device* in any occupancy by its owner.

322.4 Battery charging areas . Where approved, *powered micromobility devices* shall permitted to be charged in a room or area that complies with all of the following:

1. Only listed devices utilizing listed charging equipment shall be permitted to be charged.
2. Is provided with sufficient electrical receptacles to allow the charging equipment for each device to be directly connected to a receptacle. Extension cords and relocatable power taps shall not be used.
3. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted.
4. The charging operation shall not be conducted in or obstruct any required means of egress.
5. Removable storage batteries shall not be stacked or charged in an enclosed cabinet unless the cabinet is specially designed and approved for such purpose.
6. A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations unless each battery is isolated from neighboring batteries by an approved fire-resistant material.
7. A minimum of 18 inches (457.2 mm) shall be maintained between <u>the locations of the batteries on</u> each powered *micromobility* devices during charging operations.
8. The indoor room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection.

Commenter's Reason: During testimony it was identified that the limit on the number of personal use devices in residential occupancies would be problematic and a number is not necessary, the exception identifying that they are for personal use addresses the issue of using a residential occupancy as a base for commercial use. This proposal simply deletes the number limitation. There was mention of the difference in the title of the proposed section and the title of the referenced standard, however, the section captures more devices that the applicability of the referenced standard and proposed section 322.3 on listing only apply the standards "as applicable". Finally, there was concern about the 18 inch separation, however, thermal runaway from a devices battery can jet that far. This modification does clarify that the distance is between battery locations on the device.
This Public Comment 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: FCAC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The net effect of the proposal does not increase construction costs, but will increase operation costs for those leasing or utilizing the devices in a commercial setting. The Public comment can have a beneficial cost impact by clarifying the language.

Public Comment# 2455

Public Comment 2:

IFC: CHAPTER 2, SECTION 202, , CHAPTER 3, SECTION 322, 322.1, 322.1.1, 322.2, 322.3, 322.4, 322.5

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

POWERED MICROMOBILITY DEVICES . Motorized bicycles, motorized scooters and other personal mobility devices powered by a ~~lithium-ion or lithium metal~~ rechargeable battery. The term does not include motor vehicles that are required to be registered with the Department of Motor Vehicles for the state or jurisdiction

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 322
POWERED MICROMOBILITY DEVICES

322.1 General . Lithium-ion and lithium metal battery *powered micromobility devices* shall be operated and maintained in accordance with this section.

~~Exceptions~~ Exception:

1. ~~1.~~ Storage, repair ~~and~~ or charging in individual residential ~~occupancies~~ dwelling units of not more than 5 battery *powered mobility devices*~~, provided that such devices are for personal use by its owner.~~
2. ~~2. Charging of a single *powered mobility device* in any occupancy by its owner.~~

~~**322.1.1 Prohibited locations .** The use of a residential occupancy as a business for the charging of commercially owned *powered mobility devices* as part of a rental or sales service shall not be permitted.~~

322.2 Battery chargers and equipment . *Powered micromobility devices* shall be charged in accordance with their listing and the manufacturer's instructions using only the original equipment manufacturer-supplied charging equipment or charging equipment in accordance with the listing and manufacturer's instructions.

322.3 Listing . *Powered micromobility devices* shall be listed and labeled in accordance with UL 2272 or UL 2849, as applicable.

322.4 Battery charging areas . Where approved, *powered micromobility devices* in buildings or portions of buildings used for the commercial sales or rentals of more than 5 devices, shall permitted to be charged in a room or area that complies with all of the following:

1. Only listed devices utilizing listed charging equipment shall be permitted to be charged.
2. Is provided with sufficient electrical receptacles to allow the charging equipment for each device to be directly connected to a receptacle. Extension cords and relocatable power taps shall not be used.
3. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted.
4. The charging operation shall not be conducted in or obstruct any required means of egress.
5. Removable storage batteries shall not be stacked or charged in an enclosed cabinet unless the cabinet is specially designed and approved for such purpose.
6. A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations unless each battery is isolated from neighboring batteries by an approved fire-resistant material.
7. A minimum of 18 inches (457.2 mm) shall be maintained between each powered *micromobility* devices during charging operations.
8. The indoor room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection.

322.5 Fire safety plan . In buildings or portions of buildings used for commercial sales or rentals of more than 5 *powered micromobility devices*, ~~A~~ a fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

Commenter's Reason: As currently written, the current proposal is not enforceable. This modification improves the proposal in the following ways:
-It improves the definition, since other metals may be used in the device batteries.

-It allows the storage and recharging of these devices in multi-family buildings.

-It allows people to recharge these devices at their homes similar to people recharging electric vehicles and working for a company like Uber or Lyft.

-It requires commercial operations to meet more stringent standards.

It was noted that the chargers on these devices are rated at 1 or 2 Amps input, for a 115-120 Volt receptacle. Therefore, if they are listed and labeled, they are safe to operate in a home, on a 20 Amp circuit (meeting National Electrical Code). Other home appliances, such as refrigerators and microwave ovens, safely use between 5 and 10 Amps on a receptacle.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
In buildings with commercial sales or rentals of these devices, the requirements in Section 322.4 will increase the cost of construction.

Public Comment# 2551

F27-21

Proposed Change as Submitted

Proponents: Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, New York State Department of State, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Revise as follows:

403.9 Group R occupancies. Group R occupancies shall comply with Sections 403.9.1 through ~~403.9.3.4.~~ 403.9.4.4

Add new text as follows:

403.9.3 Group R-3 transient occupancies.
Group R-3 lodging houses, transient congregate living facilities and transient boarding houses shall comply with Sections 403.9.3.1 and 403.9.3.2.

403.9.3.1 Evacuation diagrams for transient occupancies.
A diagram depicting two evacuation routes and the location of the nearest fire alarm boxes shall be posted on or immediately adjacent to every required egress door from each sleeping unit.

403.9.3.2 Emerergancy **Instructions.**
The evacuation diagram will include the following instructions:

1. Procedures to be followed when a smoke alarm activates or fire alarm signal sounds.
2. Procedures to be followed in case of fire or appearance of smoke.

Reason: The diagrams will provide quick and important information to the occupants in case of an emergency. This information will be readily available and consistent with other transient lodging occupancies such as hotels. Even though the R - 3 classification typically represents a smaller building than a R - 1 occupancy, some of the buildings' layouts may be more confusing as many transient lodging houses (Bed and Breakfasts) are converted from older homes. The transient occupants will likely not be familiar with the structure to use an alternative route for egress or activate the alarm system.

Cost Impact: The code change proposal will increase the cost of construction
The requirement to provide diagrams and some supplemental information will cause a very minor cost increase in the construction cost of a R-3 building with transient occupants.

F27-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: These occupancies do not require fire alarm systems so there would not be fire alarm boxes. (Vote: 13-0)

F27-21

Individual Consideration Agenda

Public Comment 1:

IFC: 403.9.3.1

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) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

403.9.3.1 Evacuation diagrams for transient occupancies . A diagram depicting two evacuation routes ~~and the location of the nearest fire alarm boxes~~ shall be posted on or immediately adjacent to every required egress door from each sleeping unit.

Commenter's Reason: During the Committee Action Hearing, it was identified that fire alarm boxes are not required for these buildings, therefore the requirement to the nearest fire alarm boxes has been removed.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The requirement to provide diagrams and some supplemental information will cause a very minor cost increase in the construction cost of a R-3 building with transient occupants.

Public Comment# 2565

F28-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

403.1 General. In addition to the requirements of Section 401, occupancies, uses and outdoor locations shall comply with the emergency preparedness requirements set forth in Sections 403.2 through 403.11.3.3. Where a fire safety and evacuation plan is required by Sections 403.2 through ~~403.10.5~~ 403.10.6, evacuation drills shall be in accordance with Section 405 and employee training shall be in accordance with Section 406.

403.10 Special uses. Special uses shall be in accordance with Sections 403.10.1 through ~~403.10.5~~ 403.10.6.

Add new text as follows:

403.10.6 Lithium-ion and lithium metal batteries.
An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling, storage of lithium-ion batteries or lithium metal batteries or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries.

Exceptions. A fire safety and evacuation plan is not required for the storage or merchandizing of any of the following:

1. New or refurbished batteries installed for use in the equipment or vehicles they are designed to power
2. New or refurbished batteries packed for use with the equipment or vehicles they are designed to power for merchandizing purposes;
3. New or refurbished lithium-ion batteries rated at no more than 300 Watt-hours and lithium metal batteries containing no more than 25 grams of lithium metal in their original retail packaging;
4. The storage, repair and charging activities in detached one- and two-family dwellings and townhouses, provided that such devices are for personal use.

403.10.6.1 Mitigation planning.
The *approved* fire safety and evacuation plan shall include thermal runaway event mitigation measures addressing activities undertaken to prevent thermal runaway, early detection of a thermal runaway event and mitigations measures to be undertaken to limit the size and impact of the event on occupants and the facility.

Reason: Lithium-ion and lithium batteries have been a contributing factor in a growing number of fire incidents for several years, and they are being used in an ever increasing number of products and applications. This proposal requires a fire safety and evacuation plan to be prepared and maintained for occupancies involving battery related activities, and storage, handling and use. Emergency action plans and early mitigation are key elements in providing for occupant and facility safety and for reducing the size of an event.

403.10.6 identifies a broad range of occupancies, use and activities that involve lithium-ion and lithium metal batteries that have the potential of a large event due to a thermal runaway.
The exceptions to 403.10.6 are designed to not require a fire safety and evacuation plan for the storage and merchandizing of products containing lithium-ion or lithium metal batteries, or the storage and merchandizing of small batteries in retail packaging. An exception is included for personal use vehicle and devices in detached one- and two-family dwellings and townhouses. These exceptions are similar to those in other proposals this cycle.

At 403.10.6.1 the fire safety and evacuation plan must take into consideration mitigation planning for a thermal runaway event involving the lithium-ion and lithium metal batteries. Early mitigation is a key to preventing events and controlling the size of event should one occur.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be an operational cost related to writing and maintaining the plan and employee training. However many of these occupancies are already required to maintain fire response plans and provide employee training.

F28-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

403.10.6 Lithium-ion and lithium metal batteries. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling, or storage of lithium-ion batteries or lithium metal batteries, or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries.

Exceptions. A fire safety and evacuation plan is not required for the storage or merchandizing of any of the following:

1. New or refurbished batteries installed for use in the equipment or vehicles they are designed to power
2. New or refurbished batteries packed for use with the equipment or vehicles they are designed to power for merchandizing purposes;
3. New or refurbished lithium-ion batteries rated at no more than 300 Watt-hours and lithium metal batteries containing no more than 25 grams of lithium metal in their original retail packaging;
4. The storage, repair and charging activities in detached one- and two-family dwellings and townhouses, provided that such devices are for personal use.
5. The storage, repair and charging activities associated with personal use in sleeping units and dwelling units of Group R-1 and R-2 occupancies.

Committee Reason: This proposal is correlates with the actions taken on F21-21 and F25-21. This proposal was felt necessary to address the fire hazards that activities associated with lithium ion or lithium metal batteries create. A fire safety and evacuation plan is critical. Each occupancy may need to be treated differently but this provides the general framework with appropriate exceptions. The modification provides an exemption for multifamily dwelling units to be consistent with existing exceptions for one and two family dwellings. (Vote: 13-1)

F28-21

Individual Consideration Agenda

Public Comment 1:

IFC: 403.10.6

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

403.10.6 Lithium-ion and lithium metal batteries . An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling, storage of lithium-ion batteries or lithium metal batteries or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries.

Exceptions. A fire safety and evacuation plan is not required for the storage or merchandizing of any of the following:

1. New or refurbished batteries installed for use in the equipment or vehicles they are designed to power
2. New or refurbished batteries packed for use with the equipment or vehicles they are designed to power for merchandizing purposes;
3. New or refurbished lithium-ion batteries rated at no more than 300 Watt-hours and lithium metal batteries containing no more than 25 grams of lithium metal in their original retail packaging;
4. The storage, repair and charging activities in detached one- and two-family dwellings and townhouses, ~~provided that such devices are for personal use.~~ .
5. The storage, repair and charging activities ~~associated with personal use~~ in sleeping units and dwelling units of Group R-1 and R-2 occupancies.

Commenter's Reason: The language about "personal use" is not enforceable. How is a code official supposed to know whether a vehicle is being used for personal or non-personal use? What is someone is using the vehicle for personal use 10% of the time? Or 90%?
In terms of the vehicles or batteries, how would it make a difference if a "personal" vehicle is operated in the same city or town for several hours a day, traveling X miles compared to a "non-personal" vehicle traveling for the same number of hours and the same number of miles? It would have the same impact on the vehicle and the batteries.

The proposed modification improves the language in this proposal by removing unenforceable language.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This modification just removes unenforceable language from the original proposal and has no construction cost impact.

Public Comment# 2641

F30-21

Proposed Change as Submitted

Proponents: Chase Browning, representing Medford Fire Department

2021 International Fire Code

Revise as follows:

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through ~~503.1.3~~ 503.6

Exceptions:

1. The *fire code official* is authorized to modify or exempt fire apparatus access roads where any of the following conditions occur:
   1.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
   1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
   1.3. There are not more than two Group R-3 or Group U occupancies.
   1.4. Solar photovoltaic power generation facilities.

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall ~~comply with the requirements of this section and shall~~ extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the *exterior walls* of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

~~**Exceptions:**~~

~~1. The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:~~

~~1.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.~~

~~1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an *approved* alternative means of fire protection is provided.~~

~~1.3. There are not more than two Group R-3 or Group U occupancies.~~

~~2. Where *approved* by the *fire code official*, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.~~

Reason: The current language in 503.1.1 includes "The fire apparatus access road shall **comply with the requirements of this section** and shall extend to within 150 ft...." (bold text added by proponent for emphasis). If the intent is for access roads to meet all of 503 in order to 'comply,' then the text should be revised in 503.1 to include all of 503.1 through 503.6.
Also, the exceptions were revised slightly to provide more flexibility when addressing site-specific conditions that would benefit from modifications to the road beyond extending the 150 ft dimension. This is already a common practice to provide incentives for developers to include sprinklers, and this revised text will provide clearer support for modifying widths, allowing steeper grades, turning radii, etc.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intent is to provide additional design flexibility and equivalency.

F30-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There were several concerns with moving from Section 503.1.1 under the general section for fire apparatus access roads (Section 503.1). The current location is felt to be the right balance between water supply and access. With this movement maintenance requirements may be lost and the ability to use these provisions to negotiate for additional fire protection will be lost. This will also make it more difficult to get proper access from developers. Finally, as written, item 1.4 is unclear that the intention is only for solar farms and not for photovoltaics on buildings. (Vote: 13-1)

F30-21

Individual Consideration Agenda

Public Comment 1:

IFC: 503.1, 503.1.1

Proponents: Tanner Fairrington, representing Medford Fire-Rescue (tfairrington@yahoo.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

503.1 Where required . Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.6
Exceptions:

1. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction and shall comply with the requirements of this section. Where approved by the ~~The~~ *fire code official*, ~~is authorized to modify or exempt~~ fire apparatus access roads shall be permitted to be exempted or modified where any of the following conditions occur:
   1.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.
   1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
   1.3. There are not more than two Group R-3 or Group U occupancies.
   1.4. ~~Solar~~ Ground-mounted photovoltaic power generation facilities.

503.1.1 Buildings and facilities . ~~*Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire~~ Fire apparatus access ~~road~~ roads shall extend to within 150 feet (45 720 mm) of all portions of ~~the facility~~ facilities and all portions of the *exterior walls* of the first story of ~~the building~~ buildings as measured by an *approved* route around the exterior of ~~the building~~ buildings or ~~facility~~ facilities.

Commenter's Reason: This public comment is intended to address the concerns raised in the committee action hearing report for this proposal while maintaining the intention of the proposal. The primary objective of the proposal and this public comment is to clarify these code sections, and to expand the use of tools available to fire code officials when meeting the access requirements of Section 503 is challenging. The public comment attempts to further clarify that the fire code official maintains the authority to require fire apparatus access roads to meet the requirements of Section 503, including maintenance, and the authority to approve exemptions and modifications.
Based on experience and discussion with fire code officials across the country, the proposal and public comment would:

- Provide clarity to the user by moving all general code requirements from 503.1.1 to 503.1.
  - The model code language creates confusion by providing general and specific code requirements in 503.1.1.
- Provide clarity that the requirements of Section 503 shall be provided for and maintained. Concerns were raised with the original proposal that maintenance requirements would be lost. Currently, the general requirement in 503.1 to maintain fire apparatus access roads is limited to 503.1.1 to 503.1.3. Expanding this general requirement fixes a loophole in the code.
  - For example, clarifying that the entirety of Section 503 shall be maintained provides a path to requiring trimming of vegetation to maintain the vertical clearance requirements of 503.2.1
- Give fire code officials a clear code path to approve tradeoffs, such as fire protection systems, when access requirements are not met
  - The concern was raised by the committee that the proposal would limit the fire code officials ability to approve trade offs. Currently, fire

code officials are limited to using tradeoffs, such as a sprinkler system, to the specific 150 ft reach requirement of 503.1.1. The proposal and public comment intend the expand the fire code official's ability to use of tradeoffs such as sprinklers for other requirements in 503, such as the dead-end requirements of 503.2.5 or the grade requirement of 503.2.7.

- Align the code language with how the code is being used and provide clear language that the fire code official has the authority to approve trade-offs. Concerns were raised that the original proposal would result in weakening the fire code officials opportunity to approve tradeoffs when access requirements are not met, and make it challenging for fire code officials to require developers to provide adequate access. The model code language, the proposal, and this public comment do not provide an outright code path for developers / designers to use exceptions. Instead, they provide the fire code official with clear authority to approve modifications and exemptions for all of section 503.
- The exception for photovoltaic systems was modified based on input from the committee to correlate to the commentary which clarifies that this section is intended to apply to ground-mounted photovoltaic systems.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The intent is to provide fire code officials with additional flexibility and options to provide tradeoffs that provided a reasonable level of safety when the strict letter of the code cannot be met for fire apparatus access. This additional flexibility has the potential to significantly reduce the cost of construction which could provide housing opportunities in locations with housing challenges.

Public Comment# 2804

F43-21

Proposed Change as Submitted

Proponents: Alan Perdue, Safer Buildings Coalition, representing Safer Buildings Coalition (alan.perdue@saferbuildings.org)

2021 International Fire Code

Revise as follows:

510.4.2 System design. The in-building, two-way emergency responder communication coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1225 ~~1221~~.

510.5 Installation requirements. The installation of the in-building, two-way emergency responder communication coverage system shall be in accordance with NFPA 1225 ~~1221~~ and Sections 510.5.2 through 510.5.5.

Delete without substitution:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

~~1221—19~~ ~~Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems~~

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

1225-2021 Standards for Emergency Services Communications

Reason: Through the NFPA consolidation process, NFPA standard 1221 was changed to NFPA 1225. This proposal aligns the subject of Emergency Responder Communications with the correct NFPA standard. NFPA 1225 2022 Edition will need to be added to the referenced standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a simple change of NFPA standard numbers due to the NFPA consolidation process.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 1225-2021, Standards for Emergency Services Communications, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F43-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved based upon the consolidation of NFPA standards. NFPA 1221 has now been consolidated into NFPA 1225. (Vote: 13-1)

F43-21

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 Administration requests As Submitted

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard(s) NFPA 1225-2021 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
N/A

Public Comment# 2989

F49-21

Proposed Change as Submitted

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation, testing 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.

SECTION 603
ELECTRICAL EQUIPMENT, WIRING AND HAZARDS

603.1 General. Electrical equipment, wiring and systems required by this code or the International Building Code shall be installed, used and maintained in accordance with NFPA 70 and Sections 603.2 through 603.10.

Add new text as follows:

603.4.2 Disconnect means marking.
The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

603.4.3 Multiple supply connections marking.
Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

Revise as follows:

603.4.1 ~~Labeling~~ Electrical room marking. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating "ELECTRICAL ROOM" or similar *approved* wording.
~~The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.~~
~~Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.~~

603.5.1 Listing. Relocatable power taps shall be *listed* and *labeled* in accordance with UL 1363. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be *listed* and *labeled* in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.
2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.
3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.

603.6.2 Ampacity. The ampacity of the extension cords shall be not less than the rated ~~capacity~~ ampacity of the portable appliance supplied by the cord.

604.5 Maintenance of elevators. Elevator features and lobbies required by Section 3006 of the *International Building Code* shall be inspected, tested and maintained in accordance with Sections 604.5.1 through 604.5.4.

605.5 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4 and ambulatory care facilities.

Exceptions:

1. Portable unvented fuel-fired heaters *listed* and *labeled* in accordance with UL 647 are permitted to be used in one- and two-family dwellings, where operated and maintained in accordance with the manufacturer's instructions.
2. Portable outdoor gas-fired heating appliances in accordance with Section 605.5.2.

606.3 Operations and maintenance. Commercial cooking systems shall be operated, inspected and maintained in accordance with Sections 606.3.1 through 606.3.4.

608.2 Permits. An operational permit ~~Permits~~ shall be obtained for refrigeration systems as set forth in section 105.5.44.~~in accordance with Sections 105.5 and 105.6.~~

Reason: This proposal is a "clean-up" of several items inadvertently overlooked in the comprehensive Chapter 6 re-organization submitted by F-CAC and approved last cycle. This proposal:

1. Makes the language and terminology consistent throughout the chapter; adds "testing" and "inspection" to the scoping sections where appropriate.
2. Adds "and labeled" after "listing" where appropriate and to be consistent with other requirements in this Chapter for listing and labeling of equipment.
3. Moves the permit requirement from the Chapter General Section to Section 608 for mechanical refrigeration; removes references for permits for equipment or operations no longer regulated by this Chapter.
4. Revised and or added section titles for additional clarity.

Note that Section 603.4.1 was broken into several sections as follows:

603.4.1 ~~Labeling.~~ Electrical room marking. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating “ELECTRICAL ROOM” or similar approved wording.

603.4.2 Disconnect means marking. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

603.4.3 Multiple supply connections marking. Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not add any new technical requirements

F49-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved with concerns to the deletion of the permit requirements. (Vote: 12-1)

F49-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com) requests As Submitted

Commenter's Reason: The original proposal was just a "clean-up" of a few items inadvertently overlooked in the comprehensive Chapter 6 re-organization submitted by F-CAC and approved last cycle. Unfortunately the original public input showed the 601.2 permit section being deleted. We are unsure where that deletion came from because there is no Section 601.2 in the IFC. There was no testimony against the proposed cleanup and the only question raised by the committee was about the deletion of the permit requirements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a simple clean up of a chapter therefore there will be no additional financial impact.

Staff Analysis: Note that Section 601.2 was shown as deleted in the original monograph for the Committee Action Hearings but the section was not actually in the 2021 IFC. This section was deleted by F59-18. This version has been updated to remove that section from the original proposal.

Public Comment# 2796

F50-21

Proposed Change as Submitted

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

603.5.1 Listing. Relocatable power taps shall be *listed* in accordance with UL 1363. Relocatable power taps attached to furnishings shall be listed and labeled in accordance with UL 962A. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be listed in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.
2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.
3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A, UL 2930, or UL 60601-1.

Add new standard(s) as follows:

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

UL 962A-2018	Furniture Power Distribution Units (with revisions through September 1, 2020)
UL 2930-2020	Outline of Investigation for Cord-and-Plug-Connected Health Care Facility Outlet Assemblies

Reason: UL 1363 is for general use relocatable power taps. UL 962A is used for relocatable power taps that are attached to furnishings, such as desks or curio cabinets.

Healthcare facility outlet assemblies (HFOAs) are another type of relocatable power tap used in healthcare facilities, and are listed in accordance with UL 2930. HFOAs are intended for use as movable connections to the power supply for cord-and-plug-connected medical electrical utilization equipment in health care facilities in accordance with Article 517 of ANSI/NFPA 70, National Electrical Code (NEC) and ANSI/NFPA 99, Health Care Facilities Code, for use in Category 2 (General Patient Care) spaces or Category 1 (Critical Patient Care) spaces, including patient care vicinities.

HFOAs include a patient equipment grounding point terminal or jack that is intended to be connected to the patient equipment grounding point of the health care facility to create a redundancy in the grounding path. If a malfunction or insulation breakdown occurs, the grounding point terminal or jack provides a secondary path of least resistance for the current and reduces the risk of electric shock to a patient. HFOAs are intended for cord-and-plug connection of medical utilization equipment that has been authorized by the health care facility governing body and that has been verified as having touch and leakage current suitably low for patient care use.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal recognizes alternatives for different types of relocatable power taps for specific uses.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- UL 962A-2018: Furniture Power Distribution Units (with revisions through September 1, 2020)
- UL 2930-2020: Outline of Investigation for Cord-and-Plug-Connected Health Care Facility Outlet Assemblies.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved due to concern with the reference to UL 2930 which is only an outline of investigation. This reference will be problematic for the healthcare industry. (Vote: 13-0)

F50-21

Individual Consideration Agenda

Public Comment 1:

IFC: 603.5.1, 603.5.1.1,

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

603.5.1 Listing . Relocatable power taps shall be *listed* in accordance with UL 1363. Relocatable power taps attached to furnishings shall be listed and labeled in accordance with UL 962A. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities . In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be listed in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A~~, UL 2930,~~ or UL 60601-1.
2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A~~, UL 2930,~~ or UL 60601-1.
3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be listed in accordance with UL 1363A~~, UL 2930,~~ or UL 60601-1.

,

UL 962A-2018 Furniture Power Distribution Units (with revisions through September 1, 2020)

,

~~UL 2930-2020~~ ~~Outline of Investigation for Cord-and-Plug-Connected Health Care Facility Outlet Assemblies~~

Commenter's Reason: The only concern raised by the committee was in regards to referencing UL 2930 for use in healthcare facilities. UL 2930 is not being included in this proposal for that reason. Therefore there will be no changes in this proposal to section 603.5.1.1 at this time.
UL 962A needs to be added as an alternative to UL 1363 because UL 1363 is for general use relocatable power taps, whereas UL 962A is used for relocatable power taps that are attached to furnishings, such as desks or curio cabinets.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no significant cost impact as many of these products already meet the requirements of the listing.

Public Comment# 2686

F55-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

608.1.1 Refrigerants other than ammonia. Where a refrigerant other than ammonia is used, refrigeration systems and the buildings in which such systems are installed shall be in accordance with ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with BSR/IIAR CO2.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Alexandria, VA 22314

BSR/IIAR CO2-2021 Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Reason: BSR/IIAR CO2 is in the process of completion for issuance in 2021. It is a new standard governing refrigeration systems that use carbon dioxide as the refrigerant, and it is designed to be a companion to ASHRAE 15, providing additional design requirements that are unique to carbon dioxide systems to supplement ASHRAE 15 and going beyond the scope of ASHRAE 15 by regulating the complete life-cycle of carbon dioxide systems. Carbon dioxide has become increasingly popular as an industrial refrigerant because it is considered efficient and climate friendly. Including IIAR's new standard will assure that these systems are properly regulated.

Cost Impact: The code change proposal will increase the cost of construction
The new standard includes requirements that reflect industry good practice but are not currently mandatory. By including the standard as a mandatory reference standard in the IMC, following industry good practice will no longer be optional for carbon dioxide systems.

Staff Analysis: A review of the standard proposed for inclusion in the code, BSR/IIAR CO2-2021: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F55-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

608.1.1Refrigerants other than ammonia. Where a refrigerant other than ammonia is used, refrigeration systems and the buildings in which such systems are installed shall be in accordance with ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with ~~BSR~~/IIAR CO2.

ANSI~~BSR~~/IIAR CO2-2021 Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Committee Reason: Approval is based upon the proponents reason statement. The modification merely addresses the fact that the standards is now an ANSI approved standard. (Vote: 14-0)

F55-21

Individual Consideration Agenda

Public Comment 1:

Proponents: CP28 Administration

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard(s) ANSI/IAR CO2-2021 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing.

Public Comment# 2990

NOTE: F60-21 PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

F60-21 Part I

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Tim Earl, representing GBH International (tearl@gbhinternational.com)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 2 WILL BE HEARD BY THE INTERNATIONAL BUILDING CODE FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

803.11.1 Foam plastics ~~combustibility characteristics~~. Foam plastics ~~materials~~ shall be allowed to be used as interior wall and ceiling finish only where in accordance with ~~on the basis of fire tests that substantiate their combustibility characteristics for the use intended under actual fire conditions, as indicated in~~ Section 2603.9 of the *International Building Code*. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

Reason: The revision to IFC Section 803.11 is for correlation with the approach taken by the companion IBC section, 803.4. IBC Section 803.4 simply references compliance with IBC Section 2603.9. However, IFC Section 803.11 (covers the same topic) currently includes additional text that partially duplicates text from IBC Section 2603.9. There is no reason for IFC Section 803.11 to partially duplicate IBC text when the section already specifically directs you to the IBC section, where the text is being pulled from.
Regarding the change to Section 2603.9, the current text "**such as, but not limited to**, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880, UL 1040 or UL 1715" and "such testing **shall be related to the actual end-use configuration** and be performed on the finished manufactured foam plastic assembly" creates an opportunity for "creative" compliance that I recently became aware of. This "creative" solution is does not seem to meet the spirit of the codes' foam plastic regulations. So what is it?

I've learned that two testing laboratories are recognizing permissible use of exposed foam plastic based on a full-scale test that evaluates controlling a fire by oxygen depletion. From what I gather, the approach involves having a sealed attic and requiring a sealing cover over attic stair/hatch opening, perhaps with a sign requiring that the stairs be kept closed. In theory, with a limited oxygen supply in the space, any fire that starts in the space and involves exposed foam plastic (without a thermal barrier) would flash quickly, consume oxygen in the space and, at least temporarily, self-extinguish. While that might seem OK, the ability to maintain such spaces as airtight during the life of a structure certainly seems questionable, and do we really want to allow unprotected foam in these spaces under the philosophy of accepting almost instantaneous fire growth with the hope of self-extinguishment? I've seen exposed foam flashover a room corner test in less than 20 seconds, and relying on self-extinguishment by oxygen depletion doesn't seem like a sound strategy for fire safety for the life of a structure. Further, I wonder about the risk of a backdraft explosion when firefighters responding to the attic fire open the attic and introduce new oxygen into a well-insulated and previously superheated space. I also understand that there is an engineer's report that accompanies test reports for this approach that is being presented to jurisdictions to encourage approval of the approach.

When I contacted one of the laboratories reportedly conducting this test and asked for test documentation or a copy of the engineering report or engineer's letter, I was told that all of this is proprietary and could not be shared. Hence, I've prepared this proposal to bring this "loophole" (in my opinion) out in the open. I am hopeful that the testing labs and/or industry who are promoting the acceptability of this approach to fire safety for exposed foam plastic will show up at the code development hearing to provide sufficient technical justification, as perhaps there's something that's not yet come forward that should be considered. Lacking acceptable justification, it is my opinion that the enabling text in ICC codes should be deleted to close what I regard as a loophole in our approach to fire safety for foam plastics. It is important that the International Code prescribe reasonable and appropriate approval parameters for the use of foam plastics, because ICC Evaluation Service, who produce AC377 and ICC 1100 Standard for Spray-applied Polyurethane Foam Plastic Insulation, and other evaluation and testing companies are otherwise without limitation with respect to what they choose to develop as acceptable testing and approval parameters. If the code provides specific regulations, evaluation services and test labs will be obliged to follow the code, or at least explain variances in their approval criteria.

Furthermore, it is worth noting that, when this "loose" code text was added to legacy codes, standardized testing of foam plastics had not yet reached maturity. Today however, we have several recognized and standardized tests for this purpose, and continuing to maintain "loose" text in the code seems unjustified. If the oxygen depletion strategy is one that ICC might ultimately choose to recognize, then that strategy should become associated with a standardized test procedure that can be included in the code versus leaving the current loophole.

It is noted that similar text appears in Section 316.6 of the IRC, and it is my intent to process a correlating code proposal to the IRC in Group B.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not add any requirements but deletes a permitted approach for approval of foam plastic materials. There is the potential that materials that materials that had been approved based on non standard tests would have to be retested.

F60-21 Part I

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that the proposal is correlating language and IBC Section 2603 has all the information necessary and there is no need to redirect people to Section 104.10 since it is known that it is there and additionally the action correlates with the decision that's already made being by the IBC FS committee unanimously on Part II. (Vote: 13-1)

F60-21 Part I

F60-21 Part II

Proposed Change as Submitted

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Tim Earl, representing GBH International (tearl@gbhint.com)

2021 International Building Code

Revise as follows:

2603.9 Special approval. Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on one of the following large-scale tests. ~~such as, but not limited to,~~

1. NFPA 286 ~~(with~~ using the acceptance criteria of Section 803.1.1.1~~)~~
2. FM 4880
3. UL 1040
4. UL 1715

Such testing shall be ~~related to the actual end-use configuration and be~~ performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as *interior finish* on the basis of these ~~special~~ tests shall also conform to the *flame spread* and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

Reason: The revision to IFC Section 803.11 is for correlation with the approach taken by the companion IBC section, 803.4. IBC Section 803.4 simply references compliance with IBC Section 2603.9. However, IFC Section 803.11 (covers the same topic) currently includes additional text that partially duplicates text from IBC Section 2603.9. There is no reason for IFC Section 803.11 to partially duplicate IBC text when the section already specifically directs you to the IBC section, where the text is being pulled from.
Regarding the change to Section 2603.9, the current text "**such as, but not limited to**, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880, UL 1040 or UL 1715" and "such testing **shall be related to the actual end-use configuration** and be performed on the finished manufactured foam plastic assembly" creates an opportunity for "creative" compliance that I recently became aware of. This "creative" solution is does not seem to meet the spirit of the codes' foam plastic regulations. So what is it?

I've learned that two testing laboratories are recognizing permissible use of exposed foam plastic based on a full-scale test that evaluates controlling a fire by oxygen depletion. From what I gather, the approach involves having a sealed attic and requiring a sealing cover over attic stair/hatch opening, perhaps with a sign requiring that the stairs be kept closed. In theory, with a limited oxygen supply in the space, any fire that starts in the space and involves exposed foam plastic (without a thermal barrier) would flash quickly, consume oxygen in the space and, at least temporarily, self-extinguish. While that might seem OK, the ability to maintain such spaces as airtight during the life of a structure certainly seems questionable, and do we really want to allow unprotected foam in these spaces under the philosophy of accepting almost instantaneous fire growth with the hope of self-extinguishment? I've seen exposed foam flashover a room corner test in less than 20 seconds, and relying on self-extinguishment by oxygen depletion doesn't seem like a sound strategy for fire safety for the life of a structure. Further, I wonder about the risk of a backdraft explosion when firefighters responding to the attic fire open the attic and introduce new oxygen into a well-insulated and previously superheated space. I also understand that there is an engineer's report that accompanies test reports for this approach that is being presented to jurisdictions to encourage approval of the approach.

When I contacted one of the laboratories reportedly conducting this test and asked for test documentation or a copy of the engineering report or engineer's letter, I was told that all of this is proprietary and could not be shared. Hence, I've prepared this proposal to bring this "loophole" (in my opinion) out in the open. I am hopeful that the testing labs and/or industry who are promoting the acceptability of this approach to fire safety for exposed foam plastic will show up at the code development hearing to provide sufficient technical justification, as perhaps there's something that's not yet come forward that should be considered. Lacking acceptable justification, it is my opinion that the enabling text in ICC codes should be deleted to close what I regard as a loophole in our approach to fire safety for foam plastics. It is important that the International Code prescribe reasonable and appropriate approval parameters for the use of foam plastics, because ICC Evaluation Service, who produce AC377 and ICC 1100 Standard for Spray-applied Polyurethane Foam Plastic Insulation, and other evaluation and testing companies are otherwise without limitation with respect to what they choose to develop as acceptable testing and approval parameters. If the code provides specific regulations, evaluation services and test labs will be obliged to follow the code, or at least explain variances in their approval criteria.

Furthermore, it is worth noting that, when this "loose" code text was added to legacy codes, standardized testing of foam plastics had not yet reached maturity. Today however, we have several recognized and standardized tests for this purpose, and continuing to maintain "loose" text in the code seems unjustified. If the oxygen depletion strategy is one that ICC might ultimately choose to recognize, then that strategy should become associated with a standardized test procedure that can be included in the code versus leaving the current loophole.

It is noted that similar text appears in Section 316.6 of the IRC, and it is my intent to process a correlating code proposal to the IRC in Group B.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not add any requirements but deletes a permitted approach for approval of foam plastic materials. There is the potential that materials that materials that had been approved based on non standard tests would have to be retested.

F60-21 Part II

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee determined that the four prescriptive paths in this section are already allowed using section 104.11. The committee sees no issue with allowing different tests and standards for Foam plastic, special approval. The four different prescriptive paths need to be considered individually. The committee also prefers to reference chapter 1, section 104.11, Alternative materials, design, and methods of construction and equipment.
One of the committee members mentioned unintended consequences. In some instances, AHJ's use this section for products that pass the prescriptive tests, but they think it was not the same as the application, and they use this section to require a full-scale test. (Vote: 13-0)

F60-21 Part II

Individual Consideration Agenda

Public Comment 1:

IBC: 2603.9

Proponents: Eric Banks, representing North American Modern Building Alliance (NAMBA) (eric.banks@ewbanksconsulting.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

2603.9 Special approval . Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on one of the following large-scale tests.

1. NFPA 286 using the acceptance criteria of Section 803.1.1.1
2. FM 4880
3. UL 1040
4. UL 1715
5. Other *approved* large-scale fire test for uses identified in Section 2603.4.1

Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as *interior finish* on the basis of these tests shall also conform to the *flame spread* and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

Commenter's Reason: F60-21 Part II, as submitted, removed options and guidance language for large-scale fire tests to permit foam plastics in certain uses, limiting users to a list of four standard tests. Testimony and committee comments questioned the need to treat foam plastic differently than other materials in the code. Foam plastics behave differently than other combustibles and their fire performance can only be adequately assessed through large scale fire tests related to the actual end-use configuration. This Public Comment restores the requirements that the fire tests be large-scale and that the testing be related to actual end use configurations.
Guidance regarding the use of these large-scale tests is necessary to ensure a high level of fire safety and help code officials determine if an alternate test is appropriate. This public comment is intended to provide that guidance. Without it, inappropriate tests could be submitted and approved under the provisions of Section 104.11 that reduce fire safety.This public comment is necessary because F60-21 Part II is limited in focus to uses of foam plastic insulation with a thermal barrier and as an interior finish. Section 2603.4.1 describes uses of foam plastics where the prescribed thermal barrier is not required; uses such as attics, floors, and crawl spaces. F60-21 Part II eliminated the requirement for testing related to actual end use configurations and large scale testing, thereby creating a barrier to obtaining approvals for these other uses under Section

2603.4.1. While attempting clarity, F60-21 Part II resulted in confused language in the code and a potential reduction in fire safety that needs to be addressed.

This Public Comment will:

- Maintain the stringency of the code by clarifying that small scale tests are not sufficient to determine end use fire performance.
- Provide code officials more relevant information to make decisions.
- Preserve use of special testing tailored to specific end-use configurations, such as exposed foam plastic insulation and use of non-prescriptive coverings typically found in attics, crawl spaces and other uses where a thermal barrier is not required.

Without this public comment, F60-21 Part II will result in:·

- Implicit allowance of small-scale and other testing for attics and crawl spaces, creating a reduction in fire safety
- Increased workload, confusion, and variability in the application, use, and enforcement of Section 2603.9 by Building Departments.
- Increased confusion and variability in the application, use, testing and enforcement of Section 2603.9 by Evaluation and Certification Agencies.

We respectfully request Approved as Modified by this Public Comment. The modification is an improvement to the existing Code language and we feel addresses the Proponent's concerns expressed in the original reason statement and subsequent testimony.

Background

The four (4) methods identified in F60-21 Part II (NFPA 286, FM 4880, UL 1040, and UL 1715) are all test methods that apply to qualify alternative uses of foam plastic insulation as a wall and/or ceiling interior finish where a thermal barrier is required. These test methods are not appropriate for all the foam plastic uses that are regulated under Section 2603.4.1 where a thermal barrier is not required, such as roof, attic, header/rim joist, crawl space, or floor assemblies. Additionally, as stated in their respective scopes, these four tests are not appropriate to evaluate uses subject to Section 2603.6 Roofing.

When F60-21 Part II strikes "…related to actual end use configuration…" it removes key guidance and information for code officials to reasonably apply ANSI/FM 4880 under 2603.9, as well as NFPA 286 and UL 1715, where multiple test specimen configuration options are permitted. Both UL 1715 and NFPA 286 contain provisions regarding installation of test specimens:

- On walls only
- On ceilings only
- On both walls and ceilings

The code, since the 2000 IBC and the preceding legacy codes going back to the 1976 ICBO *Uniform Building Code,* has provided an allowance for alternate large-scale tests with the specific requirement that they must be representative of the end use configuration AND tested in maximum thickness. Proponents of F60-21 Part II argued that these tests should be removed in favor of the alternative testing that is allowed in Section 104.11 but, in so doing, the wording change loses the associated special requirements for large scale test so it has reduced the stringency of the Code by implying that small scale tests might then be acceptable. This reduction in stringency is opposed by the foam plastic insulation industry and deviates from the FTC Consent Order in 1974 (The Society of the Plastics Industry, Inc., et al, F.T.C. Docket No. C-2596. November 4, 1974) that cautioned against small scale tests alone as the basis for the safe use of foam plastic insulation.

F60-21 Part II will create a conflict with Section 2603.4 that effectively eliminates the ability to obtain Special Approval for uses, such as attics, crawl spaces, rims/headers, roofing, floors and other applications, identified under Section 2603.4 (Sections 2603.4.1.1 - 2603.4.1.14) where the thermal barrier prescribed under Section 2603.4 is not required. The provisions for these uses range from allowances to leave the foam plastic exposed (i.e. no covering or protection) to allowing protection by materials other than a thermal barrier material or an interior finish in accordance with Section 803.1.1.1.

Since the inclusion of this Special Approvals Section in the code, the following widely accepted evaluation and performance standards have been developed and used for evaluating foam plastic insulations for compliance with the IBC, IRC, IFC, and IECC. These standards include provisions for uses without prescriptive thermal barriers and uses without prescriptive ignition barriers

- ICC-Evaluation Service (ICC-ES) *Acceptance Criteria for Foam Plastic Insulation (AC12)*,
  - Appendix A – Testing for Use in Attics and Crawl Spaces without a Code-prescribed Ignition Barrier
  - Appendix B – Alternative Fire Test Method for Attics and Crawl Spaces
  - Appendix C – Test Method for Crawl Space Evaluation
- ICC-ES *Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377)*, and
  - Appendix D – Alternate Testing for Use in Attics and Crawl Spaces with Alternates to Code-prescribed Ignition Barrier
  - Appendix E – Test Method for Crawl Space Evaluation
  - Appendix X – Testing for Use in Attics and Crawl Spaces with Alternatives to Code-prescribed Ignition Barrier
  - Appendix Y – Testing for Use on Sill Plates and Headers without a Code-prescribed Thermal Barrier

- ICC-1100 *Standard for Spray-applied Polyurethane Foam Plastic Insulation*.
    - Section 302.4 – Alternative thermal barrier assembly—room corner fire tests
    - Section 302.5 – Testing for alternative ignition barrier assembly for use in attics
        - Section 302.5.1 Test Method A
        - Section 302.5.2 Test Method B
    - Section 302.6 – Testing for alternative ignition barrier assembly for use in crawl spaces
        - Section 302.6.1 Test Method C
        - Section 302.6.1.2 Test Method D

This public comment restores essential language to require large-scale testing related to the actual end-use configuration while accepting and supporting the clarifying language of the original F60-21 Part II proposal.

Recommendation

We respectfully request Approved as Modified by this Public Comment. The modification is an improvement to the existing Code language and we feel addresses the Proponent's concerns expressed in the original reason statement and subsequent testimony.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry (CPI), ACC North American Flame Retardant Alliance (NAFRA), Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association (EIMA), EPS Industry Alliance (EPS-IA), GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association (MCA), Owens Corning, Polyisocyanurate Insulation Manufacturers Association (PIMA), and Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The original cost impact statement indicated the proposal sought to eliminate a permitted approach to approval and, therefore, there is potential for retesting [of approved] materials [in accordance with one of the four standard tests identified] - arguably presenting additional testing cost incurred by manufacturers and possibly other stakeholders. The net effect of the proposal as Modified by this Public Comment is that no new requirements are added.

Public Comment# 2679

F63-21

Proposed Change as Submitted

Proponents: Timothy Stacy, representing Southern Oregon Fire Code Officials

2021 International Fire Code

Revise as follows:

903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
5. The *fire area* contains a multiple-theater complex.

903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

2021 International Building Code

Revise as follows:

[F] 903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
5. The *fire area* contains a multi-theater complex.

[F] 903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).

2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
~~3.~~ 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
~~3.~~ 4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

Reason: Serving and consuming alcohol occurs across a variety of assembly use-groups, which can result in an increased hazard to the community. Cognitive impairment can result in delayed response and evacuation during emergencies, which increases the risk to occupants in assembly spaces. It is not uncommon to see alcohol being served and consumed in an A-3 gymnasium-type occupancy, for example, or in the seating area of a theater designated as A-1. Revision to the A-2 section is not being proposed since the 100 occupant provision is already provided in the code.

Cost Impact: The code change proposal will increase the cost of construction
Reducing the threshold for the sprinkler scoping provisions will likely increase construction costs, but design benefits also live inside the code that should be examined case by case.

F63-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were based on the issues discussed regarding occupancy classification and additionally the specific proposed requirement criteria of fire area. (Vote: 10-4)

F63-21

Individual Consideration Agenda

Public Comment 1:

IFC: 903.2.1.1, 903.2.1.3, 903.2.1.4; IBC: [F] 903.2.1.1, [F] 903.2.1.3, [F] 903.2.1.4

Proponents: Chase Browning, representing Medford Fire Department (chase.browning@cityofmedford.org); Andrew Bevis, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

903.2.1.1 Group A-1 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
~~3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.~~
3. ~~4.~~ The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

4. ~~5.~~ The *fire area* contains a multiple-theater complex.

903.2.1.3 Group A-3 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. ~~The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.~~
3. ~~4.~~ The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

2021 International Building Code

[F] 903.2.1.1 Group A-1 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. ~~The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.~~
4. ~~3.~~ The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
5. ~~4.~~ The *fire area* contains a multi-theater complex.

[F] 903.2.1.3 Group A-3 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.
4. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.4 Group A-4 . An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. ~~The *fire area* where alcoholic beverages are being consumed has an *occupant load* of 100 or more.~~
3. ~~4.~~ The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

Commenter's Reason: This public comment revision is on behalf of the original proponent of F63.We have revised to focus solely on the A-3 group. An A-2, as defined, is where the intended use is for food and drink. An A-3 use is not primarily intended for alcohol consumption, however, the use of alcohol often does occur, and this proposal addresses that risk. This closes an unintentional loophole in the code that would permit alcohol being present and the risk of not being addressed. The 'fire area' description for where alcohol is consumed is intended to correlate in concept with the other three conditions in 903.2.1.3 as a threshold for sprinkler scoping provisions, which would result in sprinklers throughout all stories of an A-3 and all stories to and including the level of exit discharge serving that occupancy.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This modification would increase the cost of construction but since it focuses only on Group A-3, the impact will be less than the original proposal.

Public Comment# 2423

F68-21

Proposed Change as Submitted

Proponents: Steve Skalko, Stephen V. Skalko P.E. & Associates LLC, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, representing PCI (esmith@pci.org)

2021 International Fire Code

Revise as follows:

903.2.10 Group S-2 enclosed parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages where ~~any~~ either of the following conditions exist:

1. Where the *fire area* of the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.

~~3. Where the *fire area* of the open parking garage, in accordance with Section 406.5 of the *International Building Code*, exceeds 48,000 square feet (4460 m^2).~~

903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exceptions:

1. Occupancies in Group F-2.
2. Open parking garages

2021 International Building Code

Revise as follows:

[F] 903.2.10 Group S-2 enclosed parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages where ~~any~~ either of the following conditions exists:

1. Where the fire area of the enclosed parking garage in accordance with Section 406.6 exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage in accordance with Section 406.6 is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.

~~3. Where the *fire area* of the *open parking garage* in accordance with Section 406.5 exceeds 48,000 square feet (4460 m^2).~~

[F] 903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exceptions:

1. Occupancies in Group F-2.
2. Open parking garages

Reason: Code change F110-18 that modified Section 903.2.10 of the International Fire Code (and International Building Code) to require sprinkler protection in open parking garages was based on a single fire incident that occurred in the UK in January, 2018. All the details of this incident were not known at the time of the 2018 Code Action Hearing (CAH). However, upon review of the final report by the Merseyside Fire and Rescue Service (MFRS), the parking garage in question, referred to as a car park in the UK, had design features that likely contributed to fire spread between floors resulting in a far larger number of vehicles becoming involved than typical for vehicle fire incidences [Merseyside Fire Rescue Service, *Kings Dock Car Park Fire Protection Report,* April 2018, Merseyside, UK].
The following are two of the most notable differences of these design features contributing to the spread of fire in the UK car park incident:

1. The car park had a light gauge aluminum drainage tray attached to the underside of each precast floor panel and in line with the joint of the precast floor system. The trays led to plastic vertical piping to transfer liquids to the building storm water drainage system. The design called for a 1/2-inch gap between floor panels to permit drainage into the aluminum tray below. This gap in the floor joints allowed burning fuel spills from vehicle gas tanks to flow into the aluminum tray, which has a low melting point, thus allowing the spill to continue directly to floors below and spread fire to vehicles on lower floors.
    - In the United States the floor joints are not commonly left open. They are typically sealed by a combination backer rod and sealant or covered by the placement of a concrete topping with tooled and sealed joints. This not only minimizes spread of fire by leaking fuels to floors below, but also inhibits the spread of flames from the incident floor to vehicles on floors above.
2. The building code requirements in the UK permitted only a 15-minutes structural fire resistance of the precast concrete floors for the Kings Dock car park. The fire exposure from the initial vehicle (and subsequent vehicles) damaged the underside of the floor panels above sufficient enough to permit the fire to extend upward to vehicles on the next parking level.
    - In the US the typical precast floor systems in open parking garages meet at least a minimum of a 1-hour fire resistance, which increases significantly the ability to prevent fire spread between floors.

Further, data on fire incidences in the United States show that fires in open parking garages are very low. The US Fire Administration statistics show an average of over 1.7 million fires for the period from 1999 to 2002 [FA-311, *Fire in the United States 1994-2004,* 14th edition, August 2007] . When compared to the 1760 average total parking garage fires described in an NFPA study of parking garage fires [M. Ahrens, *Structure and Vehicle Fires in General Vehicle Parking Garages,* NFPA, January 2006], the parking garage fires represent less than 0.1% of the fire incidences.

F110-18 also cited changing material composition in vehicles increases risk of fire incidences. Fire experience in the United States, as noted above, does not support this premise. In fact, one of the conclusions in a recent study of fire incidences in parking structures 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".* Improvements to fire safety requirements in the International Building Code in the last decade have focused on life safety, which usually includes requiring sprinkler protection. However, the NFPA-RF Study affirms that life safety in open parking garages, both in terms of injuries and fatalities, is not an issue. Other factors cited in F110-18 include the increased use stored energy systems in vehicles (i.e., electric vehicles). No doubt electric vehicles are on the rise, albeit somewhat slowly. The most common electric vehicles use lithium-ion batteries as their source of power. The risk of fire from these batteries is when a thermal runaway of the battery cells occurs. Though there have been isolated incidences of thermal runaway in lithium-ion batteries with no apparent cause, most instances of thermal runaway occurrences happen in vehicles related to damage when the vehicle is involved in an accident. The NFPA-RF study points out that *"lithium-ion batteries are more difficult to extinguish than gasoline or diesel fires, requiring large amounts of water to fully contain and mitigate the hazard".* This raises questions, even with increased electric vehicle use, whether adding sprinklers is an effective measure since the sprinkler protection will not deliver large quantities of water to the seat of the battery fire. As a side note, the move to electric vehicles reduces the risk of fire spread from liquid fuels in vehicle gas tanks.

Based on the information above the requirement for mandatory sprinkler protection in open parking garages should be removed from the IFC. It imposes an unnecessary and unwarranted cost to the owners both in terms of installation as well as long term maintenance of the system. This is especially compounded in colder climates subject to freezing where dry pipe systems will be required.

Cost Impact: The code change proposal will decrease the cost of construction
The net effect of this code change proposal will be to decrease the cost of construction by eliminating an unnecessary and unwarranted expense for the cost to install a sprinkler protection system.

F68-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that this is a new code section and it has only been in a published code for about a couple months and it hasn't been applied yet as it was intended in the last code cycle. Additionally, it was stated that throughout the entire executive summary of the NFPA report that is referenced in the reason statement, it talks about the need for viable sprinkler protection with more research to be done and until that research is done that shows that sprinkler protection is not going to be effective, it should be remaining in the code. (Vote: 13-1)

F68-21

Individual Consideration Agenda

Public Comment 1:

IFC: 903.2.10, 903.2.11.3; IBC: [F] 903.2.10, [F] 903.2.11.3

Proponents: Stephen Skalko, representing Precast Concrete Institute (svskalko@svskalko-pe.com); Edith Smith, representing PCI (esmith@pci.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

903.2.10 Group S-2 ~~enclosed~~ parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as ~~enclosed~~ parking garages where ~~either of enclosed~~ any of the following conditions exist:

1. Where the *fire area* of the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.
3. Where the fire area of the open parking garage in accordance with Section 406.5 of the International Building Code exceeds 48,000 square feet (4460 m).

   Exception: Open parking garages of Type I or IIA construction where uniformly distributed openings are provided on at least three sides of the structure in accordance with Section 406.5.2. The area of such openings shall be not less than 40 percent of the total perimeter wall area of each tier.

903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exceptions:

1. Occupancies in Group F-2.
2. Open parking garages of Type I or IIA construction where uniformly distributed openings are provided on at least three sides of the structure in accordance with Section 406.5.2 of the *International Building Code*. The area of such openings shall be not less than 40 percent of the total perimeter wall area of each tier

2021 International Building Code

[F] 903.2.10 Group S-2 ~~enclosed~~ parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as ~~enclosed~~ parking ~~enclosed~~ garages where ~~either of~~ any of the following conditions exists:

1. Where the fire area of the enclosed parking garage in accordance with Section 406.6 exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage in accordance with Section 406.6 is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.
3. Where the fire area of the open parking garage in accordance with Section 406.5 exceeds 48,000 square feet (4460 m).

   Exception: Open parking garages of Type I or IIA construction where uniformly distributed openings are provided on at least three sides of the structure in accordance with Section 406.5.2. The area of such openings shall be not less than 40 percent of the total perimeter wall area of each tier

[F] 903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exceptions:

1. Occupancies in Group F-2.
2. Open parking garages of Type I or IIA construction where uniformly distributed openings are provided on at least three sides of the structure in accordance with Section 406.5.2. The area of such openings shall be not less than 40 percent of the total perimeter wall area of each tier

Commenter's Reason: The original proposal (F68-21) referred to the recent study funded by the National Fire Protection Association Research Foundation [*Modern Vehicle Hazards in Parking Structures and Vehicle Carriers*, July 2020]. In recommending disapproval of F68-21, the Fire Code Development Committee noted that the study infers a need for viable sprinkler protection. However, in the Executive Summary of the report the authors did not state that premise. Instead, they advise that one of the current knowledge gaps for open parking garage fires is viable sprinkler protection. They go on to state the focus of research is needed *"to better evaluate and analyze the threat of modern vehicle fires in open parking garages. This understanding is also critical to determine the best approach to reduce the risk of catastrophic fir*es". In arriving at that premise, the authors of the study based some of their conclusions from fire incidences at the Kings Park (Echo Arena) in the U.K and a fire at a car park at Stavanger Airport – Norway. The study cited large economic losses that occurred in these open parking structures for their conclusions. However, the present fire history in the United States does not show this same level of economic loss.
Data on fire incidences in the United States shows that fires in open parking garages are very low. The following is a recap of the readily available data from independent sources provided in the original proposal showing that open parking structures have not been experiencing significant fire incidences like that which was used to justify mandatory sprinkler protection in open parking garages when F110-18 was submitted:

- 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] represent less than 0.1% of the fire incidences.

- NFPA fire incident data on its online database that was collected and analyzed for the period from 2014 to 2018 show a total of 2,453 vehicle fires in vehicle storage structures or fire stations. This data excluded single family dwellings. The total number of fire incidences reported for that period for all occupancy types is 493,797 fires. Thus, these vehicle fires represent less than 0.5% of the total fire incidences in the U.S. The property loss from these 2,453 vehicle fires totaled $41,739,297. This represents about $17,000 per incident. (www.nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/Fires-by-Occupancy-or Property-Type/).

Code change F110-18 that modified Section 903.2.10 of the International Fire Code (and International Building Code) to require sprinkler protection in open parking garages was based on the single fire incident known as the Kings Dock or Echo Arena car park fire.

All the details of this incident were not known at the time of the 2018 Code Action Hearing (CAH). However, upon review of the final report by the Merseyside Fire and Rescue Service (MFRS), the parking garage in question, referred to as a car park in the UK, had design features and operating conditions that likely contributed to fire spread between floors resulting in a far larger number of vehicles becoming involved than typical for vehicle fire incidences [Merseyside Fire Rescue Service, *Kings Dock Car Park Fire Protection Report,* April 2018, Merseyside, UK]. Those features included little fire resistance for the floor systems of the structure, open drain slots in the floors and reduced openings on each tier for natural ventilation.

The building code requirements in the UK permitted only a 15-minutes structural fire resistance of the precast concrete floors for the Kings Dock car park. The building code regulations in Norway allowed a performance-based design which provided a 10-minute fire resistance for the car park at Stavanger Airport. In the United States the typical precast floor systems in open parking garages meets at least a minimum of a 1-hour fire resistance, which increases significantly the ability to prevent fire spread between floors.

Open drainage slots in the Kings Park car park floors allowed leaking fuel from gas tanks, hastened by water being discharged into the building by the fire service, to readily flow down into the next level of parking thus spreading the fire between floors. Such floor designs with slots are not commonly used in open parking structure designs in the United States.

Finally, natural ventilation for the Kings Park car park was hindered by reduced openings in the sides of the parking structure which hampered the ability for the fire service to perform interior suppression activities due to heat and smoke accumulating within the garage.

To be proactive in keeping the risk of catastrophic open parking garage fires lower, while still recognizing the excellent fire record in open parking garages, this public comment proposes to maintain the requirement for sprinkler protection of open parking garages. However, the proposal will

permit sprinklers to be omitted from open parking garages that utilize noncombustible materials for the structure, provide a minimum of one hour of fire resistance for the structure, and provide increased openings around three sides of the structure for enhanced natural ventilation and access for the fire service. These three parameters were the ones lacking in the Kings Park fire incident used for justification in the original submittal of F110-18. Reduced structural fire resistance was also one of the deficiencies in the Stavanger Airport car park fire.

Recommend Approval as Modified by this public comment.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The net effect of this code change proposal will be to decrease the cost of construction by eliminating an unnecessary and unwarranted expense for the cost to install a sprinkler protection system in open parking garages of noncombustible construction which have at least one-hour of structural fire resistance and are provided with increased openings on at least three sides.

Public Comment# 2903

F69-21

Proposed Change as Submitted

Proponents: Andrew Bevis, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Joe Scibetta, representing BuildingReports (jscibetta@buildingreports.com)

2021 International Fire Code

Add new definition as follows:

ANIMAL HOUSING FACILITY. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

SECTION 322
ANIMAL HOUSING FACILITIES

322.1 Sources of Ignition.
Smoking or the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in all areas of an animal housing facility, including agricultural buildings housing livestock or poultry.

322.2 Waste Housekeeping.
Permanent storage of waste shall be prohibited in aisles, hallways, or other types of egress components.

903.2.11.6 Animal housing facilities.
An automatic sprinkler system in accordance with Section 903.3 shall be provided throughout animal housing facilities that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

2021 International Building Code

Add new definition as follows:

ANIMAL HOUSING FACILITY. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

[F] 903.2.11.6 Animal housing facilities.
An *automatic sprinkler system* in accordance with Section 903.3 shall be provided throughout *animal housing facilities* that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

Reason: This proposal does two things: it addresses a special type of occupancy that is not covered by IBC or IFC by providing a definition of animal housing and it addresses when residential occupancies are mixed with animal housing facilities. It is important for the IBC to recognize the special operations that take place in these unique facilities, where a secondary population is wholly reliant on a primary population for the necessary, prompt attention required during a fire emergency. Additionally, this proposal addresses the concerns of the code committee from the previous cycle. Further clarification is provided within the definition of what type of facilities are considered animal housing facilities. This proposal's main goal is to make the protection of human occupant's paramount, i.e., where residential dwelling or sleeping units are part of the animal housing facility. It also addresses the concern from the committee that the protection of occupant's lives was secondary. The model codes currently do not adequately address facilities in which people may delay evacuation for the care of animals.
Many states exempt agricultural buildings and is often and traditionally lumped in with "animal housing". A lot of jurisdictions and residents unconsciously do not get permits or inquire about construction codes because of being classified as an agricultural community. The addition of a dwelling unit to a barn, stable, or veterinary office triggers permits and automatic fire sprinkler systems.

Fire data indicates that 98% of civilian injuries in livestock or poultry storage properties were due to structure fires. While 64% of those fires were caused by heating equipment and electrical distribution and lighting equipment. Fires within livestock production properties, 84% of civilian injuries were due to structure fires. While 53% of those fires were caused by heating equipment and electrical distribution and lighting equipment.

Fire sprinklers are installed in some animal housing facilities and have a significant impact saving lives and property. The McKinney, TX Fire Department responded to an incident at The Collin County Animal Shelter. First responders upon arrival noted the fire alarm was sounding and strobes activated. The investigation revealed the fire sprinkler system had activated and extinguished the fire within the shelter. A single sprinkler is credited for the minimal fire damage and reinforced the value of fire sprinkler systems. Shelter staff reported no injuries to the 124 sheltered animals. “This successful sprinkler save continues to demonstrate the effectiveness of automatic fire sprinkler systems in a commercial environment. Had a fire sprinkler system not been present, the outcome may have been very different,” said Deputy Fire Marshal Andrew Barr.

Another fire occurred in the Sea Life Center’s avian curatorial on the second floor of the facility. Firefighters saw smoke coming from the building upon arrival and discovered that the fire sprinkler system had already extinguished what was believed to have been a small electrical fire. No staff or other animals were injured in the fire.

Cost Impact: The code change proposal will increase the cost of construction
The change may increase the cost of construction due to the increased level of life safety for the occupants.

F69-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that the proposal is scoped too large and the proposed definition includes very different types of uses of buildings and Group R occupancies are already covered under the sprinkler sections currently and could be enforced for that type. Additionally, it was noted that the cost increase for some of these buildings would be very significant. However it was acknowledged that there should be some type of protection, but the request was made to include informational data on the incidents that have occurred. (Vote: 12-2)

F69-21

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION 202, SECTION 322, 322.1, 322.2, 322.3 (New), 903.2.11.6; IBC: SECTION 202, [F] 903.2.11.6

Proponents: Andrew Bevis, representing National Fire Sprinkler Association requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

ANIMAL HOUSING FACILITY . Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; ~~kennels; animal shelters;~~ ~~animal hospitals and veterinary facilities;~~ zoos; laboratories; agricultural facilities housing animals; ~~and mercantile or business occupancies with animals~~ and similar uses but excludes one- and two-family dwellings, townhouses and multifamily residential buildings.

SECTION 322
ANIMAL HOUSING FACILITIES

322.1 Sources of Ignition . Smoking or the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in all areas of an animal housing facility, including agricultural buildings housing livestock or poultry.

322.2 Waste Housekeeping . Permanent storage of waste shall be prohibited in aisles, hallways, or other types of egress components.

322.3 Fire Protection .
Fire protection shall be provided in accordance with Section 903.2.11.6

903.2.11.6 Animal housing facilities . An automatic sprinkler system in accordance with Section 903.3 shall be provided ~~contain Group R occupancies or~~ throughout *animal housing facilities* that are greater than 10,000 sq. ft.~~or where occupants are expected to delay their emergency~~

~~egress to care for animals.~~

2021 International Building Code

ANIMAL HOUSING FACILITY . Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; ~~kennels; animal shelters; animal hospitals and veterinary facilities;~~ zoos; laboratories; agricultural facilities housing animals; ~~and mercantile or business occupancies with animals. with animals~~ and similar uses but excludes one- and two-family dwellings, townhouses and multifamily residential buildings.

[F] 903.2.11.6 Animal housing facilities . An *automatic system* in accordance with Section 903.3 shall be provided throughout *animal housing facilities* ~~that contain Group R occupancies or~~ that are greater than 10,000 sq. ft. ~~or where occupants are expected to delay their emergency egress to care for animals.~~

Commenter's Reason: We agree with the committee's statement that the R occupancies would already by covered by the protection requirements of the Section 903. The reference to R occupancies has been removed. Additionally, the committee felt that definition was scoped too large and contained too many types of uses. The business and mercantile uses were taken out of the definition, only leaving the large agricultural uses that house a large amount of animals or exotic animals that would need to be protected. A square footage threshold has now been provided that will trigger when sprinklers would be required. The threshold of 10,000 sq. ft. was chosen because this is a common threshold provided in other standards of similar uses. This is also double the square footage of a permittable type VB, U use not including a frontage increase. This provides a reasonable cushion and design ability left in the hands of owners and designers. By providing sprinkler protection in these occupancies provides a higher level of fire fighter safety. Fire fighters often feel compelled to save these animals. This provides more time to rescue the highly valued animals and provide a level of protection for those participating in the rescue operations.

The committee also asked for fire additional fire date to substantiate the proposal. Since the Committee Action Hearings in April, there have been three major fires that have resulted in millions of dollars in property damage. A barn fire in Minnesota, that took nine departments and twenty tankers to extinguish the fire, resulted in approximately 12,000 pigs being lost in addition to the structure. Another barn fire in Columbus, Nebraska resulted in 10,000 hogs lost along with the structure. Finally, in Protivin, Iowa an additional 4,400 sows were lost in yet another barn fire in addition to the entire structure. Based on current USDA's report, "Weekly Average Weight of Barrows and Gilts," (week ending 6/1321) the average weight of a hog was 212.3 lbs. The USDA's report, "National Daily Hog and Pork Summary" (dated 6/17/21) states that national average of a pig carcass ranged from $114.40-$137.00. Based on those numbers the three previously mentioned fires resulted in $3-$3.6 million dollars in property loss and that does not include the structures and equipment.
Below are just few more barn fire statistics provided the Animal Welfare Institute.

Arizona - 3/6/21 - 166,000 chickens

Michigan - 2/15/21 - 16,500 turkeys

Pennsylvania - 1/21/21 - 67,000 chickens

New York - 4/29/21 - 60 cows

Missouri - 2/18/21 - 10 horses

The list goes on and on and on. Not only are livestock at risk but millions of dollars worth of racing horses and exotic animals.

Additionally, the NFPA report, "" indicates that 98% of civilian injuries in livestock or poultry storage properties were due to structure fires. While 64% of those fires were caused by heating equipment and electrical distribution and lighting equipment. Fires within livestock production properties, 84% of civilian injuries were due to structure fires. While 53% of those fires were caused by heating equipment and electrical distribution and lighting equipment.

It is abundantly clear that it is time to protect these use groups. This proposal is a reasonable approach in solving this fire problem that costing the farmers of America millions and millions of dollars.

Resources:

https://awionline.org/content/2021-barn-fire-statistics-state

https://www.ams.usda.gov/mnreports/ams_2705.pdf

https://www.ams.usda.gov/mnreports/lsddhps.pdf

https://www.keyc.com/2021/05/17/waseca-barn-fire-kills-an-estimated-pigs/

https://theindependent.com/news/state-and-regional/crime-and-courts/10-000-hogs-killed-building-destroyed-in-fire-at-pillen-family-farms/article_3de3b8cc-adc5-5090-b3da-754bd73f4d3e.html

http://www.crescotimes.com/news/about-4400-sows-lost-fire

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The code change proposal will increase the cost of construction The change may increase the cost of construction due to the increased level of property protection.

Public Comment# 2375

F72-21

Proposed Change as Submitted

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Paula Cino, representing National Multifamily Housing Council (pcino@nmhc.org); Dan Buuck, National Association of Home Builders, representing National Association of Home Builders (dbuuck@nahb.org); Margo Thompson, Newport Ventures, representing National Multifamily Housing Council (mthompson@newportventures.net)

2021 International Fire Code

Revise as follows:

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.
2. The floor level of the highest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from *grade plane*.

2021 International Building Code

Revise as follows:

[F] 903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. The floor level of the highest *story* is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest *story* is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Reason: During the previous code development cycle, an issue of significant concern was rectified with respect to NFPA 13R sprinklers in Group R occupancies in podium-style buildings and allowance for as many as four stories up to 60’ in height above grade to be constructed on top of the horizontal building separation. However, while continuing to allow for NFPA 13R systems in four story Group R occupancies, the height limit from fire department vehicle access to the floor level of the highest story was changed to only 30’. In most cases, this height limit will not allow for NFPA 13R sprinklers in a four-story apartment building.
According to feedback from contractors, developers, and design professionals, typical height of floor assembly framing in multifamily buildings is slightly less than twelve inches. A four-story apartment building with 8’-6” ceiling heights and the necessary 8” to 12” foundation exposure above grade, would exceed this 30’ limit. Likewise, a very common mixed use building type of three stories of residential occupancy above ground level retail space would also exceed the 30’ limit. The current 30’ limit is at the very low end of fourth-story floor level height and offers little flexibility for floor-to-ceiling heights greater than 8’-0”. With the current 30’ limitation, NFPA 13R sprinkler systems are essentially limited to three-story buildings: The NFPA 13R standard was specifically created to permit these systems in buildings up to four stories. This proposal will allow the use of NFPA 13R sprinkler systems as envisioned by the standard.

It is also important to understand that the floor level measurement is not taken from the grade adjacent to the building but from the lowest level of fire department vehicle access, which can be up to 150 feet away. The difference in elevation over that distance can be significant, further limiting the number of buildings which can meet this section. Below is an example of a 4-story multifamily building. The 4th floor is at a height of 32' above grade. However, the dimension used as the threshold for a 13R system increases where the lowest level of fire department vehicle access is below the level of grade at the building.

The dimension of 35' was selected as the limit because it allows more flexibility for building design and floor-to-ceiling height while still remaining well within the 75' reach of typical fire truck ladders. It is also significantly lower than the 60' height limit which had been in place prior to the code change in 2021.

NFPA 13R systems have been extremely effective in protecting human lives as well as preventing significant property damage from fire in low-rise residential buildings since the NFPA 13R Standard was first published in 1989. A 2016 issue of the NFPA Journal published the findings of a workshop attended by subject matter experts that focused on the adequacy of 13R sprinklers. Overarching conclusions were 1) that major fires in 13R-protected buildings were the exception – not the rule and 2) that there was not sufficient evidence to indicate that 13R sprinklers have not been effective in protecting human life and reducing property damage. To quote the June 2016 NFPA Report describing the outcomes of the workshop:

- *"NFPA 13R/13D are effective standards that reduces loss of life and building damage due to a fire event."*
- *"To consider or make any changes to NFPA 13R/13D, better (more refined) data needs to be identified as well as collected on a consistent basis. A national database that describes fire events with information on building type/codes would assist in making intelligent changes to any sprinkler standards."*

Essentially limiting the use of NFPA 13R sprinkler systems to Group R buildings three-stories or less does not recognize other significant changes in the codes in recent cycles that offer increased fire protection. Furthermore, there may be some unintended consequences with respect to the current language. Recent cycles have seen changes such as sprinkler requirements for balconies in buildings where 13R sprinklers are used, increased attic protection if it is not sprinklered such as construction of the attic using fire retardant wood or non-combustible materials, and the recent 2021 requirement for special inspections of sealing fire penetrations and draft stopping. All of these ancillary provisions have increased fire protection and stringency of the fire code. Furthermore, by reducing the use of NFPA 13R systems in R-2 occupancies, requirements for sprinkler protection of balconies in these buildings have also been reduced – historically, an issue of significant concern. By extending requirements for NFPA 13 sprinklers in R-2 occupancies, sprinkler requirements for balconies are fewer or non-existent when compared to the absolute mandate of sprinklers on balconies for NFPA 13R systems through the IBC.

Census data reports that of the 13,000 multifamily buildings completed in 2019, more than 10,000 (77%) of these buildings were four stories or less. By reducing the percentage of multifamily buildings where NFPA 13R sprinklers are permitted, the code language as it currently stands will significantly impact housing affordability. The National Multifamily Housing Council estimates that moving from NFPA 13R to NFPA 13 sprinkler systems would carry an incremental installed cost increase of approximately $1.00/sq. ft. to $2.00/sq. ft. of overall building area on average across the US.

NFPA 13R sprinklers are a very effective means of assuring life safety and property protection in Group R buildings four stories and less while maintaining housing affordability. An increase in height to 35' above or below the lowest level of fire department vehicle access is reasonable and modest and can easily be reached by the typical fire truck ladder.' This proposal recognizes the long-standing effectiveness of 13R life safety systems, which have been allowed since the early years of the I-codes as well as the legacy codes.

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

Costs associated with requirements for attic protection in NFPA 13 systems not only includes the additional sprinklers and piping but also costs associated with increased hydraulic demand and water supply as well as necessary freeze protection in cold and even moderate climates. Greater density and spacing of sprinklers, larger pipe diameter, sprinklers in concealed spaces, and especially, requirements for attic protection (with some exceptions) all contribute to the added cost. This cost increase does not include the final cost with markup to the building owner or the potential need to add a fire pump in the NFPA 13 system. Moving from a 13R system to a 13 system for a $9,342,688, four-story, 48-unit apartment building increased construction costs by $102,255 or a little over $2,100/unit. (Home Innovation Research Labs, *Cost Analysis of Proposed Group A Code Changes (2018-2019 ICC Code Development Cycle)* – October 2018). This would have a substantial impact on both tenant rental rates and owner-occupied units. The detailed cost analysis is shown below.

Four-Story Building on Grade, 48 Units & Common Areas

[ELEVATION]

Table F117-A. Cost of NFPA 13 Sprinkler System Compared to NFPA 13R System

Component	Unit	Material	Labor	Total	w/O&P	Qty	Cost
Residential sprinkler heads	EA	16	21.50	37.5	53	292	15,476
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	4292	81,763
Wet standpipe riser, schedule 20, 4" diameter pipe	FL	5800	2875	--	8675	4	34,700
						Total NFPA 13R System	**131,939**
Additional sprinkler heads (attic)	EA	16	21.50	37.5	53	44	2,332
Additional sprinkler heads (non-exempt bathrooms)	EA	16	21.50	37.5	53	2	106
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	(4292)	(81,763)
1-1/2" CPVC piping (NFPA 13)	LF	18.55	9.75	28.3	36.50	4292	156,658
Additional 1-1/2" CPVC piping for new sprinkler heads (NFPA 13)	LF	18.55	9.75	28.3	36.50	618	22,557
Additional floor, wet standpipe riser, schedule 20, 4" diameter pipe	FL	1475	890	--	2365	1	2,365
						Total NFPA 13 System	**234,194**
						Total to Builder	**102,255**

F72-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that during the last code cycle there was a very lengthy conversation and discussion regarding this requirement where it went to the floor and it went through the process and the members were able to speak. The past testimony about lowering it to 30 feet was regarding ladder access as most fire engines today per the NFPA standard carry 35-foot ladders which will reach 30 feet high and will reach a window. As noted, there is a need to stay at the current requirement until there is proof otherwise since it hasn't even been used yet. Additionally, there was concern about going lower below grade as it was brought up in the testimony

and it was questioned why it's even being considered. (Vote: 9-5)

F72-21

Individual Consideration Agenda

Public Comment 1:

IFC: 903.3.1.2; IBC: [F] 903.3.1.2

Proponents: Chase Browning, representing Medford Fire Department (chase.browning@cityofmedford.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.
2. The floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   Exception: For Group R-2 occupancies, the floor level of the highest story is permitted to be 35 feet (10668 mm) or less above the lowest level of fire department vehicle access. This exception shall only apply where *firewalls* have not been used to define multiple buildings in accordance with Section 503.1 of the *International Building Code*.
3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from *grade plane*.

2021 International Building Code

[F] 903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. The floor level of the highest *story* is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   Exception: For Group R-2 occupancies, the floor level of the highest story is permitted to be 35 feet (10668 mm) or less above the lowest level of fire department vehicle access. This exception shall only apply where *firewalls* have not been used to define multiple buildings in accordance with Section 503.1.
3. The floor level of the lowest *story* is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Commenter's Reason: In response to feedback received during the committee hearing and afterwards, the scope of the original proposal has been narrowed to only apply to R-2 and only for cases where the entire structure complies with the area limits of Chapter 5, with no additional buildings or increased area associated with the use of firewalls to create additional buildings. A 35 foot threshold for an R-2 will provide a path to utilizing 13R for low-rise residential, four story buildings, which is important to achieve affordable and available safe housing. The 35 ft. threshold provides a reasonable and appropriate measurement that is still much more conservative than what has been allowed by code for decades until the 2021 edition, and by eliminating the allowance to create multiple buildings at this height using firewalls, demand on fire service resources is significantly diminished. Essentially, this change will take the code back to allowing basic 4-story garden apartments using 13R sprinklers. Larger buildings will still be required to use the current 30-foot above the lowest level of fire department access threshold that mandates full NFPA 13 protection.
Many communities are facing available housing issues, and cost is a major factor. A NFPA 13R system is substantially more affordable than a NFPA13 system, and the 5-foot increase proposed by this public comment will not measurably impact fire suppression tactics or the level of life safety.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction

The permissible use of NFPA 13R systems reduces cost vs. NFPA 13 systems.

Public Comment# 2972

Public Comment 2:

IFC: 903.3.1.2; IBC: [F] 903.3.1.2

Proponents: Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); Margo Thompson, representing Nat (mthompson@newportventures.net) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.
2. The floor level of the highest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from *grade plane*.

2021 International Building Code

[F] 903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. The floor level of the highest *story* is ~~30~~ 35 feet (~~9144~~ 10668mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest *story* is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Commenter's Reason: NFPA 13R has been the standard for installing fire sprinkler in low-rise residential occupancies since 1989. It is scoped to multifamily buildings with a maximum of four stories, but the 2013 edition allowed these buildings to be on top of a fire-separated podium or pedestal, significantly increasing their overall allowed height to 60 feet. The 2018 editions of the IFC and IBC added requirements to address concerns regarding the fire safety of the attics in these podium-style buildings.
Last cycle, instead of reverting back to the pre-2013 limits of four stories total, which would have rectified all concerns about pedestal buildings, a much more restrictive requirement was adopted by a narrow margin. This was done before the effects of the increased fire safety measures in the 2018 edition could be assessed. This public comment is a compromise between the result of last cycle and the original four-story threshold in the standard.

13R sprinklers are currently allowed by the NFPA standard in buildings up to 4 stories and 60 feet in height. The 35-foot height proposed in this public comment is well below the 60-foot threshold and more realistically allows for 4-story Group R buildings with floor-to-ceiling heights of 8 to 10 feet which is common in multifamily buildings.

One reason given during the Committee Action Hearings for not approving even the adjustment from 30 to 35 feet is the reach of ladders carried on most fire engines. This is despite the fact that egress/ingress openings are not required on buildings protected by a 13R system.

13R sprinklers have proved effective with respect to both life safety and minimizing property damage in the event of a fire. The 2015 NFPA-sponsored workshop on the effectiveness of 13R sprinklers also concluded that there was not sufficient evidence to warrant changes to the NFPA 13R standard.

Based on testimony heard at the Committee Action Hearings, we have removed any revisions to the floor level of the lowest story.

Bibliography: National Fire Protection Association, *Workshop on Life Safety Sprinkler System Challenge - December 15-16, 2015 Lake Buena Vista, FL*, June 2016.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
Requiring a NFPA 13R system instead of a 13 system for a multifamily building can save over $2,100/unit. (*Home Innovation Research Labs, Cost Analysis of Proposed Group A Code Changes (2018-2019 ICC Code Development Cycle) – October 2018*). This would have a substantial impact on both tenant rental rates and owner-occupied units.

A detailed cost analysis is included with the original proposal.

Public Comment# 2711

Public Comment 3:

IFC: 903.3.1.2; IBC: [F] 903.3.1.2

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.
2. For other than Group R-2 occpancies, ~~T~~ the floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   For Group R-2 occupancies, the roof assembly is less than 45 feet (13716 mm) above the lowest level of fire department vehicle access. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance.
3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the International Building Code shall be measured from *grade plane*.

2021 International Building Code

[F] 903.3.1.2 NFPA 13R sprinkler systems . *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. For other than Group R2 occupancies, ~~T~~ the floor level of the highest *story* is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   For Group R-2 occupancies, the roof assembly is less than 45 feet (13716 mm) above the lowest level of fire department vehicle access. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance.
3. The floor level of the lowest *story* is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Commenter's Reason: When Proposal F117-18 was considered and approved last cycle, changing the limit for NFPA 13R systems to the current 30-foot value, the justification provided in the proponent's reason statement was entirely oriented towards addressing concerns with pedestal style buildings, and the chosen 30-foot threshold for triggering NFPA 13 protection was justified based on correlation with the trigger value for requiring standpipes. The logic offered was that standpipes require larger supply and riser piping, so the cost of upgrading to NFPA 13 protection would already be partially offset. While that's true, the piping cost offset versus the overall cost of increasing to NFPA 13 protection is insignificant. No specific life-safety or property protection basis or loss data justified the 30-foot threshold versus a few feet in either direction. Nevertheless, the approach of simply changing the current value to 35 feet doesn't address a bigger issue with the current provisions.
What was overlooked in selecting the current threshold is the common use of mezzanines in upper levels of Group R2 occupancies. From the

exterior, a mezzanine level in the 4th story would appear to be a 5th story, and such mezzanines often include a sleeping area. Yet, the current threshold would allow a NFPA 13R system to be used if the floor level of the 4th floor does not exceed the 30-foot limit. Meanwhile, a building not having mezzanine levels with a slightly higher 4th floor level, perhaps due to a slightly sloping lot and a lower fire-department access road, would be forced into using NFPA 13. The requirement to use a higher level of fire protection for a lesser risk condition makes no sense and is not justified.

This public comment offers a different approach modeled after what has already been approved by the ICC membership to address attic protection in NFPA 13R buildings in Section 903.3.1.2.3 in the 2018 edition. The approach triggers NFPA 13 protection based on the height of the attic, set at a threshold of 45 feet to reasonably allow a typical 4-story apartment building with 9-foot ceilings and 1-foot floor ceiling assemblies. The additional 5 feet accommodates the height of a grade-level slab and downward slope away from a building on a nearly-flat lot to accommodate drainage in the distance between the building and a fire access road, from which the lowest level of fire department vehicle access is measured.

In summary, this public comment will close the loophole that currently exists in the text that was added to the code in the 2021 edition, permitting a 13R protected building to have a 55-foot attic height with a tall 4th floor mezzanine without attic protection as long as the floor level of the highest occupied floor isn't over 30 feet above the lowest level of fire department vehicle access. In approving this proposal, the code will still strictly limit the permissible use of NFPA 13R to R2 occupancies that don't exceed 4 stories and which cannot include a combination of tall ceilings and upper level mezzanines. The proposal has been limited to R2 occupancies recognizing the different operational, occupant and architectural attributes of R2 vs. R1 occupancies.

Although I am a consultant to NFSA and NFSA supported the original proposal, this public comment is my own, based on having been involved in developing ICC's fire protection requirements for multifamily buildings for over 20 years, and it is not submitted on NFSA's behalf.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal cannot be specifically tied to increasing or decreasing the cost of construction, as its application is dependent on architectural choices that may or may not lead to a change in cost vs. the cost of compliance with the 2021 edition. In some cases, such as tall buildings with mezzanines, a cost increase could be experienced. In other cases, a cost reduction could be experienced, the proposal may have no impact on cost.

Public Comment# 2976

F73-21

Proposed Change as Submitted

Proponents: Chase Browning, representing Medford Fire Department

2021 International Fire Code

Revise as follows:

903.4.2 Alarms. For *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 , ~~A~~ an *approved* audible device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

2021 International Building Code

Revise as follows:

[F] 903.4.2 Alarms. For *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2, ~~A~~ an approved audible device, located on the exterior of the building in an approved location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason: It is appropriate to provide an audible alarm for NFPA 13 and NFPA 13R systems,
however, NFPA 13D (903.3.1.3) does not require such a device.

Cost Impact: The code change proposal will decrease the cost of construction
Not including the exterior bell will reduce costs.

F73-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that an exception already exists in the section charging text and all the other sections are subsections to that charging text. Additionally, it was noted that NFPA 13D systems are allowed for some structures that are not single family dwellings, which could be historic resources, and not having a bell that is going to tell you that there's a water flow going on inside is potentially going to damage those structures beyond repair. (Vote: 8-7)

F73-21

Individual Consideration Agenda

Public Comment 1:

IFC: 903.4 (New), 903.4, 903.4.1, 903.4.2, 903.4.3; IBC: 903.4 (New), [F] 903.4, [F] 903.4.1, [F] 903.4.2, [F] 903.4.3

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com); Chase Browning, representing Medford Fire Department requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

903.4 Sprinkler system supervision and alarms . *Automatic sprinkler system* supervision and alarms shall comply with Sections 903.4.1 through 903.4.3.

~~**903.4**~~ **903.4.1 Electronic supervision** ~~**Sprinkler system supervision and alarms**~~ **.** Valves controlling the water supply for *automatic sprinkler*

systems, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Limited area sprinkler systems in accordance with Section 903.3.8, provided that backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position unless supplying an occupancy required to be equipped with a fire alarm system, in which case the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.
8. Underground key or hub gate valves in roadway boxes.

~~**903.4.1**~~ **903.4.2 Monitoring .** Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an *approved* supervising station or, where *approved* by the *fire code official*, shall sound an audible signal at a constantly attended location.

~~**Exception:** Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.~~

~~**903.4.2**~~ **903.4.3 Alarms .** An *approved* audible and visual sprinkler waterflow alarm device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a water flow switch is required by Section 903.4.1 to be electrically supervised, such sprinkler waterflow alarm devices shall be powered by a fire alarm control unit or, where provided, a fire alarm system. Where a fire alarm system is provided ~~installed~~, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Exception: *Automatic sprinkler systems* protecting one- and two-family dwellings.

903.3.9 ~~**903.4.3**~~ **High-rise building floor** ~~**Floor**~~ **control valves .** *Approved* supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings.

2021 International Building Code

903.4 Sprinkler system supervision and alarms .
Automatic sprinkler system supervision and alarms shall comply with Sections 903.4.1 through 903.4.3.

[F] ~~**903.4**~~ **903.4,1 Electronic supervision** ~~**Sprinkler system supervision and alarms**~~ **.** Valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures , and waterflow switches on all sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Limited area sprinkler systems in accordance with Section 903.3.8, provided that backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position unless supplying an occupancy required to be equipped with a fire alarm system, in which case the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.
8. Underground key or hub gate valves in roadway boxes.

[F] ~~903.4.1~~ 903.4.2 Monitoring . Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an *approved* supervising station or, where *approved* by the fire code official, shall sound an audible signal at a *constantly attended location*.

~~**Exception:** Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.~~

[F] ~~903.4.2~~ 903.4,3 Alarms . An *approved* audible and visual sprinkler waterflow alarm device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a water flow switch is required by Section 903.4.1 to be electrically supervised, such sprinkler waterflow alarm devices shall be powered by a fire alarm control unit or, where provided, a fire alarm system. Where a fire alarm system is provided ~~installed~~, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Exception: *Automatic sprinkler systems* protecting one- and two-family dwellings.

[F] ~~903.4.3~~ 903.3.9 High-rise building floor ~~Floor~~ control valves . *Approved* supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings.

Commenter's Reason: Discussion at the committee hearing and the 8:7 vote clearly demonstrated varying interpretations of how Section 903.4 should be applied and that the section needs a more comprehensive rewrite to fix the existing issues. This public comment does the following to address all points of concern:

1. Creates a scoping section. Some interpret the existing exceptions in 903.4 as applying to the subsections under Section 903.4, while others do not. The revision clarifies scoping and that the exceptions in 903.4 of the 2021 edition only apply to that section, and not the subsections that followed.
2. Moves/merges the exception currently under 903.4.1 (monitoring) into the retitled section above (electronic supervision). The exception primarily relates to the need for electronic supervision, not monitoring by a supervising station or constantly attended location. Thereby, it was misplaced. Further, the current exception #2 in 903.4 exempted ALL limited area systems from any electronic supervision, so one could have argued that the exception under "monitoring" never applied. Merging the exceptions fixes that conflict in a way that clarifies logical application of the current code provisions.
3. Incorporates the committee recommendation on F74 but with improved text vs. the floor amendment that was accepted by the committee. The intent of F74 is to add visual alarm devices where audible devices are currently required. As modified by the committee, F74 also clarified that water flow switches required to be electrically supervised have to be be powered by a fire alarm control unit or a fire alarm system. If this public comment is approved, it is intended to replace the committee action on F74 since this will be the last action on this section in the 2024 edition cycle.
4. Section 903.4.3 is being relocated to Section 903.3 (installation). The requirement is more appropriately co-located with installation provisions because it is requiring floor control valves.
5. The original F73 proposed exception for one- and two-family dwellings is being added to Section 903.4.3. There was general agreement at the hearing that one- and two-family dwellings should not require exterior water flow alarms, but some felt that the original proposal was unnecessary (per the scoping misinterpretation issue discussed in #1 above). Others did not support extending an outdoor water flow alarm exception to all 13D installations, as originally proposed, so this public comment only applies the exception to one- and two-family dwellings.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
Outside alarm will now clearly not be required for one- and two-family dwelling sprinkler systems. Remainder of the proposal is cleanup of existing text and new provisions added by F74.

Public Comment# 2879

Public Comment 2:

Proponents: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org)

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on Code Changes F73-21 and F74-21. If the final actions on F73-21 is AMPC and F74-21 is AM, the resulting text will not be correlated.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

F74-21

Proposed Change as Submitted

Proponents: Michael OBrian, representing Self (mobrian@codesavvyconsultants.com); Richard Boisvert, Michigan Fire Inspectors Society, representing Michigan Fire Inspectors Society (rboisvert@brightonareafire.com)

2021 International Fire Code

Revise as follows:

903.4.2 Alarms. An*approved* audible and visual device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler water flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. The exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

2021 International Building Code

Revise as follows:

[F] 903.4.2 Alarms. An approved audible and visual device, located on the exterior of the building in an approved location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. The exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason: Fire Code Officials have long found that the exterior device is not properly maintained and have changed the exterior bell to a audio/visual device. This code change does two things. The first is to update the external alarm device to be an AV Device. This device is a weather proof Horn/Strobe device that is common on many fire alarm and sprinkler system. This proposal also adds that the device is powered by the Fire Alarm System or Fire Alarm Control Unit (When required by IFC 903.4).
Most automatic fire sprinkler systems are required to be monitored and have the ability to include an exterior horn/strobe or similar device located in an approved location. By adding this requirement, we truly increase the ability of system maintenance for the life of the building. In directly this proposal:

1. Removes the need for an electrician to wire the new exterior bell which is many times powered by 110v.
2. Adding the device to the fire alarm system as required by 903.4 or 907, creates a system which will be maintained on a regular basis.
3. The added visual component, can aid in the location of exterior features such as the FDC and alert others to a water flow alarm.

This proposal does not add alarm system requirements as found by IFC/IBC 907.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The existing exterior bell and the cost of the audible/visual notification device have similar cost comparisons.

F74-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Fire Code

903.4.2 Alarms. An *approved* audible and visual device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler water flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. When the water flow switch is required by 903.4 to be supervised by a Fire Alarm Control Unit, the exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

2021 International Building Code

[F] 903.4.2 Alarms. An approved audible and visual device, located on the exterior of the building in an approved location, shall be connected to

each *automatic sprinkler system*. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. When the water flow switch is required by 903.4 to be supervised by a Fire Alarm Control Unit, The exterior audible and visual device shall be powered by the fire alarm control unit or fire alarm system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Committee Reason: The committee stated that reason for the approval of the modification is that it a good clarification that identifies when you have a water flow switch that this is required, and it does satisfy the issue about not wanting to require a fire alarm system. The stated reason for the approval of the proposal was that it is a good way to improve the response and that having the device monitored it will be known exactly when it's broken and it will be able to be fixed much sooner than during quarterly inspections. (Vote: 11-3)

F74-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org)

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on Code Changes F73-21 and F74-21. If the final actions on F73-21 is AMPC and F74-21 is AM, the resulting text will not be correlated.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

Public Comment# 2997

F76-21

Proposed Change as Submitted

Proponents: Kevin Kelly, representing Victaulic (kevin.kelly@victaulic.com)

2021 International Fire Code

Add new text as follows:

904.12 Hybrid Systems.
Hybrid Fire Extinguishing Systems shall be installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

NFPA 770-2021 Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

2021 International Building Code

Add new text as follows:

[F] 904.12 Hybrid Systems.
Hybrid Fire Extinguishing Systems shall be installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

NFPA 770-2021 Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

Reason: NFPA 770 is a new NFPA standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems. This new standard should be added to the list of Alternative Automatic Fire-Extinguishing Systems that could potentially be used for fire protection. NFPA 770 should also be added to the referenced document section.

Bibliography: NFPA 770, Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems, 2021 Edition

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change should not increase cost. It adds a new standard to the list of Alternative Automatic Fire-Extinguishing Systems that could potentially be used for fire protection.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 770-2021: Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F76-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

2021 International Fire Code

904.12 Hybrid Fire Extinguishing Systems. Hybrid Fire Extinguishing Systems shall be designed, installed, maintained, periodically inspected,

and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

2021 International Building Code

[F] 904.12 Hybrid Fire Extinguishing Systems. Hybrid Fire Extinguishing Systems shall be designed, installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

2021 International Fire Code

Add new definition as follows:

HYBRID FIRE EXTINGUISHING SYSTEM. A system which utilizes a combination of atomized water and inert gas to extinguish fire.

Committee Reason: The committee stated that the reason for the approval of the proposal with the modification was that it is an important addition to fire suppression systems with hybrid systems and it is expected to see expanded use and it provides a means to put it in the code and move forward along with the reason statement. (Vote: 14-0)

F76-21

Individual Consideration Agenda

Public Comment 1:

IBC: 202 (New)

Proponents: Kevin Kelly, representing Victaulic (kevin.kelly@victaulic.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

HYBRID FIRE EXTINGUISHING SYSTEM . A system which utilizes a combination of atomized water and inert gas to extinguish fire.

Commenter's Reason: Add a definition of Hybrid Fire Extinguishing Systems to the IBC to be consistent with the IFC. NFPA 770, Standard on Hybrid (Water and Inert gas) Fire Extinguishing Systems, was added to Chapter 904 of both the IFC and the IBC. A definition of Hybrid Fire Extinguishing Systems was only added to the IFC and the definition should have also been added to the IBC.

Bibliography: NFPA 770, Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Adding a definition of Hybrid Fire Extinguishing Systems will not increase or decrease the cost of construction.

Public Comment# 2923

F80-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit* on the side of the exit opening closest to the interior exit stairway.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

2021 International Building Code

Revise as follows:

[F] 905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the fire code official.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the exit opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit* on the side of the exit opening closest to the interior exit stairway.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit *passageway* or exit *corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each

entrance from an exit *passageway* or *exit* corridor to the mall.

5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Reason: As currently worded, the exception could be interpreted to allow elimination of the hose connections on both sides of the horizontal exit where floor areas adjacent to the horizontal exit are within 130 feet of the interior exit stairway hose connection. It has also been interpreted that this exception only allows for elimination of the hose connection on only one side of the horizontal exit. Clarification is needed to ensure consistent application of this exception.
The proposed language clarifies that the hose connection may be eliminated when it is located on the same side of the horizontal exit as the exit stairway having the hose connection within 130 feet of travel from the horizontal exit.

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

F80-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that the proposed language is cluttering up what is already written. Specifically that the proposed language of putting the hose connection now on the other side is unnecessary since it already clearly says if it's reachable from the adjacent floor area to the horizontal exit, then you don't need the other one. (Vote: 12-1)

F80-21

Individual Consideration Agenda

Public Comment 1:

IFC: 905.4; IBC: [F] 905.4

Proponents: Jeffrey Grove, representing Jensen Hughes (jgrove@jensenhughes.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

905.4 Location of Class I standpipe hose connections . Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit* ~~on the side of the exit opening closest to the interior exit stairway stairway~~ on either side of the exit opening.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot

(9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

2021 International Building Code

[F] 905.4 Location of Class I standpipe hose connections . Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the fire code official.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the exit opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit* ~~on the side of the exit opening closest to the interior exit stairway stairway.~~ on either side of the exit opening .

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit *passageway* or exit *corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit *passageway* or *exit* corridor to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Commenter's Reason: As currently worded, the exception could be interpreted to allow elimination of the hose connection only on the side of the horizontal exit that is within 130 feet of the interior exit stairway hose connection. The original intent of this exception was to eliminate the hose connections on both sides of the horizontal exit opening. Clarification is needed to ensure consistent application of this exception.
Alternatively, language could be added to the Commentary to the 2024 IBC to clarify that the intent of exception would be for the hose connection to be eliminated on both sides of the horizontal exit opening provided at least one of the sides of the exit opening is within 130 feet of the interior exit stairway hose connection.

The Committee was clear that the intent of the existing exception is that the hose connection can be omitted on both sides of the horizontal exit. The issue with the current language is that AHJs and Design Professionals are interpreting it to mean that a hose connection can only be eliminated on one side of the horizontal exit (and the specific side that it can be eliminated varies with the AHJ and Design Professional as well). Revision is necessary to ensure consistent understanding and application of the exception's intent that the hose connection can be eliminated on both sides of the horizontal exit when at least one side is within 130 feet of an interior exit stairway hose connection.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a clarification for existing code language.

F86-21

Proposed Change as Submitted

Proponents: Deborah Ohler, Ohio Board of Building Standards, representing Ohio Board of Building Standards, Staff Engineer (dohler@com.state.oh.us)

2021 International Fire Code

Revise as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load of greater than or equal to 300 and less than 15,000 occupants provided all of the following are met:
   2.1 A public address system with standby power is provided;
   2.2 Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;
   2.3 Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;
   2.4 All means of egress from the bleacher-type seating are open to the outside.

3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:
   3.1 There are no enclosed spaces under or attached to the outdoor bleacher-type seating;
   3.2 The bleacher-type seating is erected for a period of less than 180 days; and
   3.3 Evacuation of the bleacher-type seating is included in an approved fire safety plan.

2021 International Building Code

Revise as follows:

[F] 907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the *lowest level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.
2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load of greater than or equal to 300 and less than 15,000 occupants provided all of the following are met:
   2.1. A public address system with standby power is provided;
   2.2. Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of

10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;

2.3. Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;

2.4. All means of egress from the bleacher-type seating are open to the outside.

3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:

3.1. There are no enclosed spaces under or attached to the outdoor bleacher-type seating;

3.2. The bleacher-type seating is erected for a period of less than 180 days; and

3.3. Evacuation of the bleacher-type seating is included in an approved fire safety plan.

Reason: According to the IBC Section 303.6, outdoor bleacher-type seating is classified as Group A-5. Although not a typical building with walls and ceilings easily allowing for the installation of manual fire alarm boxes and occupant notification appliances, the outdoor bleacher-type seating structure, as a Group A-5 classification, results in a requirement for a manual fire alarm system with occupant notification appliances when the occupant load is 300 or more. According to Section 907.2.1.1, when the occupant load is 1000 or more, this triggers the initiation of an emergency voice/alarm communication system instead of the typical horn/strobe alarm notification appliances used for occupant notification.
The IBC Section 907.4.2 requirements for manual fire alarm boxes do not fit very well when trying to apply the requirements to outdoor bleacher-type seating. For example, let's consider a typical high school football or track field with outdoor bleacher-type seating. According to the code, the manual fire alarm box shall be located not more than 5 feet from the entrance to each exit. In this case, where is the exit and where should the boxes be mounted. Additional structures would likely need to be constructed in order to mount the manual fire alarm boxes and they would need to be weather-resistant and tamper-proof. A similar problem occurs when trying to apply the IBC Section 907.5.2 code requirements for the occupant notification devices (audible and visual alarm notification appliances). The ambient noise level at a football game could possibly far exceed 105 dBA. If this happens, the OBC Section 907.5.2.1.2 would allow the elimination of the audible alarm notification appliances provided that visible alarm notification appliances are installed. Where should the visible notification devices be mounted so that those sitting in the bleachers could see them without having to create additional mounting structures that may block the view? Given that the events are outside and sometimes occur during the daylight, it would be possible that the visible notification appliances may not even be effective at alerting those in attendance. It seems to be a huge expense, without much guaranteed benefit, especially for small outdoor bleacher-type seating structures.

After discussing this with several architects and code officials, I discovered a lot of inconsistency in the design and enforcement of this requirement for a manual fire alarm system and notification appliances for bleachers. Many designers are not providing the system and many code officials are approving the structure without the fire alarm system.

After researching the NFPA standards 101 (Life Safety Code), 102 (Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures), and 5000 (Building Construction and Safety Code), I discovered that the requirement for a fire alarm system seems to be consistent. However, the NFPA standards offer an exception that allows an alternative to the visible alarm signals such as using the scoreboard, message board, or other electronic device as a notification means. There is no such exception in the IBC.

It wasn't until after reviewing the code forum blogs that I thought to look at the ICC standard 300 which is referenced from the IBC Chapter 10, Section 1030. Section 309.1 of the ICC 300 standard offers a few exceptions to the emergency voice/alarm communication systems. I fail to understand why this exception is hidden in the standard which is referenced only from the IBC means of egress chapter and it is not clear whether the exception was also intended to apply to the manual fire alarm system with notification appliances. I contacted the proponent of the ICC 300 Section 309.1, Gene Boecker, and the author of the public comment, Greg Nicholls, to get their input regarding the intent. Both told me that they believe the exception in the ICC 300 standard is intended to exempt the required fire alarm systems from the outdoor bleacher-type seating structures in addition to exempting the emergency voice/alarm communication system.

Therefore, I am proposing to bring the ICC 300 exceptions into the fire protection system chapter of the IBC and the IFC where it is more appropriately located and more likely to be seen. I have also proposed a few modifications to the ICC 300 exceptions to remove the subjectivity and add clarity.

Bibliography: 1. ICC 300 Standard on Bleachers, Folding and Telescopic Seating and Grandstands; 2017 edition, International Code Council (ICC), Washington, DC; Section 309.1
2. NFPA 101 Life Safety Code, 2021 edition, National Fire Protection Association (NFPA), Quincy, MA, Sections 9.6 and 12.3.4

3. NFPA 102 Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2016 edition; National Fire Protection Association (NFPA); Quincy, MA; Section 9.6.3.5

4. NFPA 5000 Building Construction Safety Code; 2021 edition; National Fire Protection Association (NFPA); Quincy, MA; Sections 16.3.4, 16.4.9, 32.7, and 55.2

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

This proposal is intended to bring into the IBC and the IFC a few exceptions for fire alarm systems and emergency voice alarm communication systems. These exceptions are buried in a standard that is not referenced from Chapter 9 of the IBC or the IFC. As a result, designers and code officials may not be aware that the exception already exists.

F86-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reasons for approval were that it addresses a situation not previously anticipated for Group A-5 occupancies, includes information contained in ICC 300 that has not previously been introduced and it adds reasonable exemptions for manual fire alarm boxes serving a Group A-5 outdoor bleacher type seating. Additionally, it was noted that is does not burden the end user with buying another standard when it could easily be put into the body of the code and it is probably already being done. (Vote: 9-5)

F86-21

Individual Consideration Agenda

Public Comment 1:

IFC: 907.2.1; IBC: [F] 907.2.1

Proponents: Ali Fattah, representing City of San Diego Development Services Department (afattah@sandiego.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

907.2.1 Group A . A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load ~~of greater than or equal to 300 and~~ less than 15,000 occupants provided all of the following are met:
   2.1 A public address system with standby power is provided;
   2.2 Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;
   2.3 Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;
   2.4 All means of egress from the bleacher-type seating are open to the outside.

3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating ~~provided all of the following are met:~~ when evacuation of the bleacher-type seating is included in an approved fire safety plan.
   ~~3.1 There are no enclosed spaces under or attached to the outdoor bleacher-type seating;~~

~~3.2 The bleacher-type seating is erected for a period of less than 180 days; and~~

~~3.3 Evacuation of the bleacher-type seating is included in an approved fire safety plan.~~

2021 International Building Code

[F] 907.2.1 Group A . A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the *lowest level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.
2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load ~~of greater than or equal to 300 and~~ less than 15,000 occupants provided all of the following are met:
   2.1. A public address system with standby power is provided;
   2.2. Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less;
   2.3. Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code;
   2.4. All means of egress from the bleacher-type seating are open to the outside.
3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating ~~provided all of the following are met:~~ when evacuation of the bleacher-type seating is included in an approved fire safety plan.
   ~~3.1. There are no enclosed spaces under or attached to the outdoor bleacher-type seating;~~
   ~~3.2. The bleacher-type seating is erected for a period of less than 180 days; and~~
   ~~3.3. Evacuation of the bleacher-type seating is included in an approved fire safety plan.~~

Commenter's Reason: This public comment is submitted by proponent representing myself. I served on the ICC 300 bleacher standards committee and it is not clear to me why a temporary portable bleacher that is in service for a few days or weeks requires a fire alarm system regardless of the number of seats and duration of use. By definition temporary is less than 180 days. It is not clear how the presence of a use beneath a temporary bleacher, an unusual occurrence that I have not experienced, would necessitate the placement of a manual pull station presumably beneath the bleacher, or possibly at egress paths passing beneath the bleacher, even if the seating exceeds 300. Bleacher Sections with 300 seats are not very large and travel distances are very short. Additionally, the openness of the lattice structure will allow for smoke due to a fire below to be visible to occupants above and it appears to be an un-necessary burden and an addition of complexity to a temporary structure. Furthermore visual alarms would also be required for what possibly will be mostly a daytime service period such as at many sporting events. Exception 2 is proposed to be revised since the 300 threshold is not necessary due to an upper bound of 15,000 seats is provided. You are exempt up to and through 300 and exempt greater than 300 but less than 15,000. ICC 300 Section 309 Exception 2 needs to be deleted in a separate standards development cycle.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The code change will reduce the cost of construction by eliminating the need for a fire alarm system on a temporary portable bleacher used outdoors.

Public Comment# 2245

Public Comment 2:

IFC: 907.2.1; IBC: [F] 907.2.1

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

907.2.1 Group A . A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

2. ~~Manual fire Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are~~ A fire alarm system is not required for Group A-5 outdoor bleacher-type seating ~~having~~ with an occupant load of greater than or equal to 300 and less than 15,000 ~~occupants~~ provided all of the following are met:
   2.1 A public address system with standby power is provided~~;~~ .
   2.2 Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less~~;~~ .
   2.3 Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 ~~of this code;~~ .
   2.4 All means of egress from the bleacher-type seating are open to the outside.

3. ~~Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are~~ A fire alarm system is not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:
   3.1 There are no enclosed spaces under or attached to the outdoor bleacher-type seating~~;~~ .
   3.2 The bleacher-type seating is erected for a period of less than 180 days~~; and~~ .
   3.3 Evacuation of the bleacher-type seating is included in an approved fire safety ~~plan.~~ and evacuation plan in accordance with Section 404.

2021 International Building Code

[F] 907.2.1 Group A . A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the *lowest level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.
2. ~~Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are~~ A fire alarm system is not required for Group A-5 outdoor bleacher-type seating ~~having~~ with an occupant load of greater than or equal to 300 and less than 15,000 ~~occupants~~ provided all of the following are met:
   2.1. A public address system with standby power is provided~~;~~ .
   2.2. Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent or less of the overall area of the outdoor bleacher-type seating or 1000 ft2 (92.9 m2), whichever is less~~;~~ .
   2.3. Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 ~~of this code;~~ .
   2.4. All means of egress from the bleacher-type seating are open to the outside.
3. ~~Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are~~ A fire alarm system is not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:

3.1. There are no enclosed spaces under or attached to the outdoor bleacher-type seating~~;~~ .

3.2. The bleacher-type seating is erected for a period of less than 180 days~~; and~~ .

3.3. Evacuation of the bleacher-type seating is included in an approved fire safety ~~plan.~~ and evacuation plan in accordance with Section 404 of the *International Fire Code*.

Commenter's Reason: The original proposal was approved by the committee, and these criteria are consistent with the requirements in ICC 300 for bleachers. This Public Comment is designed to clarify the requirements of the section.
Exception 2 is modified to clarify that the the fire alarm system in its entirety is not required if the 4 criteria are met, rather than listing the specific components of the fire alarm system. This simplifies the exception and will not result in the user trying to determine what was left out of the list.

The same revision is made in Exception 3. A specific reference to the fire safety and evacuation plan in Section 404 is added to Item 3.3.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The proposal will decrease the cost of construction since a fire alarm system will not be required for the outdoor bleachers. The Public Comment will not affect the cost of construction since it only clarifies its application.

Public Comment# 2854

F90-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

907.2.16 Aerosol storage uses. Aerosol product rooms and general-purpose warehouses containing aerosol products and plastic aerosol products shall be provided with an *approved* manual fire alarm system where required by this code.

2021 International Building Code

Revise as follows:

[F] 907.2.16 Aerosol storage uses. *Aerosol product* rooms and general-purpose warehouses containing aerosol products and plastic aerosol products shall be provided with an *approved* manual fire alarm system where required by the *International Fire Code*.

Reason: Full scale fire tests are being conducted to determine the appropriate protection criteria for plastic aerosol 2 products and plastic aerosol cooking spray products.
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 adds requirements for plastic aerosol products that are not currently addressed by the IFC.

F90-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for the disapproval was that the fire tests have not been completed yet and thus not knowing what the ultimate requirement actually needs to be. (Vote: 10-4)

F90-21

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: The Committee Disapproved F90 because the fire tests for plastic aerosol 2 products was not yet completed and it is still not completed. The Reason Statement associated with the original proposal erroneously referred to the full scale fire test program being yet to be completed for plastic aerosol 2 products.
However, the International Fire Code already address plastic aerosol 3 products so the proposed changes are appropriate. Therefore the proposed changes merely clarify the fire alarm system requirements when plastic aerosol 3 products are present.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment clarifies that the fire alarm system requirements should also apply to plastic aerosol 3 products.

Public Comment# 2974

F94-21

Proposed Change as Submitted

Proponents: Thomas Daly, HSCG - representing the AH&LA, representing AH&LA (Thomas.Daly@myhscg.com)

2021 International Fire Code

Add new text as follows:

907.10.1 Replacement smoke alarms.
Where the replacement of smoke alarms is required in accordance with Section 907.10, smoke alarms with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.

Revise as follows:

1103.8.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.
4. Smoke alarms with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.

Reason: Starting with the 2021 edition of the IFC, smoke alarms must produce a 520hz signal, see Section 907.5.2.1.3.
Current versions of listed typical 120vac/9vdc powered smoke alarms, used in multiple Group R occupancies, cannot produce the 520hz signal on secondary power.

Presently, at least one manufacturer of smoke alarms (Siterwell) has a 10-year sealed battery powered smoke alarm that can produce the required 520hz signal.

NFPA 72 has permitted the use of 10-year sealed battery smoke alarms since the 2010 edition, see Sec. 29.9 in the 2019 edition and Sec. 29.6 in earlier editions. The FCAC's Work Group on Alarms has been tasked with aligning NFPA 72 requirements with the IFC.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will decrease the cost of construction/operations in existing Group R occupancies.
The 2021 IFC (Sec. 907.10) requires the replacement of smoke alarms at 10 years of age regardless of operating condition.

Group R hotels, apartments and time shares and Group I-1 congregate living facilities historically have installed smoke alarms in 'sleeping units' therein per the requirements of the 2021 (and earlier editions) of the IFC at Sections 907.2.11 and 1103.8.1, with the power requirements (Sec. 907.2.11.6) of 120vac normal power and a 9vdc battery backup for secondary power.

The NEW requirement in the 2021 IFC at Sec. 907.5.2.1.3.2 now requires such smoke alarms to emit a 520hz signal. No currently listed 120vac powered smoke alarms can produce the 520hz signal on secondary power.

The alternative is to install a monitored (24vdc) smoke detector with a sounder base which can produce the 520hz signal on secondary power.

The marginal cost difference for a 120vac powered smoke alarm (~$50 per unit installed or replaced) v. a 24vdc monitored smoke detector with a sounder base (~$700 per unit installed including devices, new circuits, power supplies and points in the FACP) is $650, assuming, for existing buildings, the building's fire alarm system is capable of supporting those additional smoke detectors (initiating devices).

The 2021 IFC impact on the Group R-1 hotel industry alone, with some 5.2 million hotel guest rooms and suites in the U.S., is therefore $3.38 BILLION, unless a more cost effective alternative is provided. That number would increase by a factor of 10 when other impacted Group R and I occupancies (apartments, time-shares and congregate living facilities) are included.

The use of a 10 year sealed battery operated smoke alarm that can produce a 520hz signal in those sleeping units of Group R & I occupancies would cost about $100 per unit installed (material, labor, taxes and shipping), resulting in a dramatic decrease in the cost of construction and operation. NFPA 72 allows for such 10 year sealed battery operated smoke alarms to protect those occupancies.

F94-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that there are quite a few issues that need to be worked out and they are not in support of replacing hardwired with complete battery backup. (Vote: 14-0)

F94-21

Individual Consideration Agenda

Public Comment 1:

IFC: 907.10.1, 1103.8.3

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

907.10.1 Replacement smoke alarms . Where the replacement of smoke alarms is required in accordance with Section 907.10, smoke alarms shall not be required to include the 520hz signal unless the smoke alarms to be replaced includes that signal. ~~with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.~~

1103.8.3 Power source . Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.
4. ~~Smoke alarms with a non-rechargeable, nonreplaceable primary battery capable of operating the device for at least 10 years in the normal condition, followed by 4 minutes of alarm, followed by 7 days of trouble shall be permitted.~~

Commenter's Reason: This public comment seeks to clarify the original concern related to potential need for using smoke alarms producing the 520hz audible alarm signal alarms for replacement smoke alarms without the 520 Hz audible alarm signal. This section clarifies that such alarms are only required where they replace smoke alarms that currently have that signal. However, this public comment does not prohibit an existing non-low

frequency smoke alarm to be replaced with a new low frequency smoke alarm. The deletion of the item 4 in Section 1103.8.3 addresses the fact that item 1 would already allow the replacement with a battery-operated smoke alarm. If this proposal is approved as modified by this public comment it should be coordinated with proposal F93-21 by renumbering this section to Section 907.10.2.
This Public Comment 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: FCAC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal as modified simply provides more options for compliance therefore will either maintain costs or potentially lower them.

Public Comment# 2235

F102-21

Proposed Change as Submitted

Proponents: Kris Hauschildt, representing self (krishauschildt@yahoo.com)

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 915 CARBON MONOXIDE DETECTION.

915.1 General. Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.

Revise as follows:

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A, B, E, F, H, I, M, ~~I-1, I-2, I-4~~ and R occupancies ~~and in classrooms in Group E occupancies~~ in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 ~~Fuel-burning appliances and f~~uel-burning fireplaces. Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies that contain ~~a fuel-burning appliance or~~ a fuel-burning fireplace.

915.1.3 Fuel-burning forced-air furnaces. Carbon monoxide detection shall be provided in ~~*dwelling units*, *sleeping units* and classrooms~~ the following locations served by a fuel-burning, forced-air furnace:

1. In a central or otherwise approved location in each HVAC zone on every floor level that is served by a fuel-burning forced air-furnace.
2. In dwelling units, sleeping units, classrooms in Group E occupancies and areas containing a swimming pool that are served by a fuel-burning forced-air furnace.

Exception: Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.3, Items 1 or 2, ~~in *dwelling units*, *sleeping units* and classrooms~~ where a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an *approved* onsite location or to an approved off-premises location in accordance with NFPA 72.

915.1.4 Fuel-burning appliances~~. outside of dwelling units, sleeping units and classrooms~~. Carbon monoxide detection shall be provided in ~~*dwelling units*, *sleeping units* and classrooms located~~ the following locations in buildings that contain fuel-burning appliances~~: or fuel-burning fireplaces.~~

1. In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that contain a fuel-burning appliance.
2. In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that have communicating openings between the fuel-burning appliance and the room, area, dwelling unit, sleeping unit or classroom; or in an approved location between the fuel-burning appliance and the room, area dwelling unit, sleeping unit or classroom.
3. In dwelling units, sleeping units, classrooms in Group E occupancies, and areas containing a swimming pool.

Exception~~s~~: Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.4, Item 3, where a carbon monoxide detector is provided in each room, area, dwelling unit, sleeping unit, or classroom in Group E occupancies that shares a common wall, ceiling or floor with the room or area containing the fuel-burning appliance, and the carbon monoxide alarm signals are automatically transmitted to an approved onsite location or to an off-premises location in accordance with NFPA 72.

~~1. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms without communicating openings between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.~~

~~2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in one of the following locations:~~

~~2.1. In an *approved* location between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.~~

~~2.2. On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.~~

915.1.5 Private garages. Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies in buildings with attached private garages.

Exceptions:

1. Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies without communicating openings between the private garage and the room, area, *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies located more than one story above or below a private garage.
3. Carbon monoxide detection shall not be required where the private garage connects to the building through an *open-ended corridor*.
4. Where a carbon monoxide detector is provided in an *approved* location between openings to a private garage and rooms, areas, *dwelling units*, *sleeping units* or classrooms in Group E occupancies.

915.1.6 Exempt garages. For determining compliance with Section 915.1.5, an open parking garage complying with Section 406.5 of the International Building Code or an enclosed parking garage complying with Section 406.6 of the International Building Code shall not be considered a private garage.

Revise as follows:

915.2 Locations. Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.~~34~~.

915.2.1 Dwelling units. Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units*.

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.

Revise as follows:

915.2.3 Areas containing a swimming pool. Carbon monoxide detection shall be installed in areas containing a swimming pool.

Exception: Where there is a conflict between the requirements of this code and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.

915.2.~~3~~ 4 Group E occupancies. Carbon monoxide detectors shall be installed in classrooms in Group E occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception:
Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an *occupant load* of 30 or less.

915.3 Carbon monoxide detection. Carbon monoxide detection required by Sections 915.1 through 915.2.~~3~~ 4 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

915.4 Carbon monoxide alarms. Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.4.~~4~~ 5.

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception:
Where installed in buildings without commercial power, ~~battery-powered~~ carbon monoxide alarms powered by a 10-year battery shall be an acceptable alternative.

915.4.2 Listings. Carbon monoxide alarms shall be *listed* in accordance with UL 2034.

915.4.3 Locations. Carbon monoxide alarms shall only be installed in *dwelling units* and in *sleeping units*. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

915.4.4 Combination alarms. Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be *listed* in accordance with UL 217 and UL 2034.

Revise as follows:

915.4.5 Installation requirements. Where required by Sections 915.1.1 through 915.5.3, carbon monoxide alarms shall be installed in accordance with Sections 915, NFPA 72, and the manufacturer's installation instructions. Where there is a conflict between the requirements of this code, NFPA 72, and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.

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

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

915.6 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 720. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

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

915.6.1 Enclosed parking garages. Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with Section 404.1 of the International Mechanical Code shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.

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

Reason: This proposal seeks to establish uniform baseline requirements for CO detection in all occupancies with permanently installed fuel-burning appliances, fuel-burning fireplaces or attached garages. CO poisoning incidents resulting in deaths and injuries continue to happen with alarming regularity in occupancies not covered by the current IFC as well as those that are, demonstrating that current code requirements are not adequately inclusive and are not effectively targeting problem areas within specific occupancies.
The suggested revisions contained in this proposal are based on *"Development of a Technical Basis for CO Detector Siting," "Diffusion of CO Through Gypsum Wallboard,"* the New York State Fire Code which has required CO detection in all commercial occupancies since 2015, and data from individual case examples (see attachment and bibliography).

Requiring CO detection in all occupancies that contain known CO hazards will prevent an untold number of deaths and injuries.

Substantiation for Uniform Baseline Requirements for CO detection in All Occupancies

The lethality of CO is undisputed. The severity of poisoning injury depends not only on the level and duration of CO exposure, but also on the individual. Those most at risk from the effects of CO: infants and children, older people, pregnant women/unborn babies, and those with underlying health conditions. There is no formula that can accurately predict how CO will impact a particular person nor what level or duration of exposure can be tolerated without suffering prolonged harm, irreversible brain damage, or death. For many victims who survive a CO exposure, the effects do not end with the poisoning incident. They can be severe enough to cause death weeks to months later. They can also cause irreversible effects, including life-altering brain injury.

"In addition to the immediate onset effects of exposure, delayed-onset development of neuropsychiatric impairment typically occurs from several days to approximately 3–4 weeks after exposure, with symptoms including inappropriate euphoria, impaired judgment, poor concentration, memory loss, cognitive and personality changes, psychosis, and Parkinsonism. Symptoms of acute carbon monoxide poisoning in children are the same as those in adults. Acute carbon monoxide poisoning during pregnancy has been associated with spontaneous abortion and fetal death."

- Agency for Toxic Substances & Disease Registry, CDC

The lifesaving value of CO detection is undisputed. CO detection has been commercially available for at least 30 years and has proven reliability. There is no substitute for the early detection that these devices provide, alerting to danger before conditions escalate to a level of causing harm. In the absence of detection, it is the building occupants who are providing the alert to CO leaks, becoming ill or dying before building staff are even aware there is a problem. Some examples:

2013, North Carolina: My parents both died in a **hotel** room from a CO leak while they were on vacation. They lost consciousness and lay helpless all night, inhaling poison for over 14 hours until they died. No one in the building was even aware they were in danger. There was no CO detection onsite despite there being gas fireplaces in the guest rooms, a gas pool heater, gas dryers and gas water heaters. First responders (EMS, police, fire dept) suspected CO but thought it was more likely they both died of heart attacks so didn't bother to test the room, opting instead to wait weeks for autopsy toxicology results. The leak continued for another seven weeks, killing an 11-year-old boy and causing permanent injury to his mother in the same room before it was finally detected. Multiple people were ill at the hotel during those seven weeks, including guests and a repairman servicing the elevator which was located next to the leaking exhaust system.

2017, Michigan: A 13-year-old boy at a spring break swim party with his friends died on the deck of a **swimming pool** from CO leaking from a pool

heater in an adjacent room. His friends suffered CO injury as well as head injuries when they lost consciousness and fell onto the concrete pool deck. An employee along with multiple firefighters suffered CO injuries responding to the incident.

** There is specific concern over the number of incidents in **indoor swimming pool areas** that have resulted in poisoning injuries to children. CO exposure in a pool also leads to an increased risk of drowning. These incidents are detailed on the attached spreadsheet.

2014, New York: A **restaurant** manager died from CO leaking from a fuel burning appliance in the room adjacent to his office. The assistant manager lost consciousness and suffered CO injury when she went looking for him. Multiple rescue personnel became injured as well when they rushed in to render aid, unaware they were entering a CO contaminated environment. 24 people were hospitalized including restaurant patrons. The manager had reportedly been ill for weeks prior, but neither he nor his doctors suspected it as being CO-related.

1995, California: A woman and her husband were poisoned in a **hotel** room, not found until 36 hours later – he died, she survived with permanent injury to her brain, so severe she was prevented from ever being able to work or live independently again. 25 years later, she lives in a specialized group home.

2006, Maryland: 20 **restaurant** workers suffered long term brain injury after being exposed to a CO leak that had gone unnoticed for weeks and progressed to a level of 700ppm in the dining area before problem was discovered.

2019, Ohio: CO leak at **correctional facility** caused poisoning injuries to 4 staff and 29 inmates

2019, Illinois: CO leak at a **dry cleaners**, 3 people taken to the hospital including a police officer

2019, Utah: 60 people were poisoned at a **church** from CO leaking from a boiler, having spent several hours breathing in CO levels measured at 200-500ppm. Many were projected to have long term health effects.

2021, Nebraska: 10 people poisoned at a **bowling alley**, 4 hospitalized.

According to NFIRS (National Fire Incident Reporting System) data, there were a total of 10,715 CO incidents in hotels/motels, churches, restaurants/cafeterias, bars/taverns, and K-12 schools between 1999 and 2018. This is a minimum number. Participation in the NFIRS system is voluntary and not all fire departments participate.

Further, deaths and injuries are occurring even in buildings equipped with CO detection, demonstrating the need for occupancy specific focus for future improvements beyond a baseline requirement:

2017, Texas: A couple was poisoned and found unconscious in their hotel room from CO leaking from a pool heater. The hotel was equipped with unmonitored CO detection. A couple staying a few doors down had removed the batteries from the CO alarm in their room after it had gone off multiple times during the night. The couple found unconscious later died of their CO related injuries.

2018, Tennessee: Several people were poisoned in a hotel exercise room, located on a floor with a pool but no guest rooms. The hotel reportedly had CO detection, but only on floors with guest rooms.

2019, Illinois: A couple was poisoned in their hotel room equipped with a CO alarm that was alarming, but a hotel maintenance worker told them to disregard the alarm. They ended up calling the fire department themselves and were treated at a hospital for CO poisoning.

As a homeowner it is a reasonable expectation to be aware of the hazards of CO and take responsibility to install CO detection to protect yourself. However, as an occupant of a building that is under someone else's charge, there is no way to know of equivalent hazards nor whether action has been taken to install safeguards. Combined with no human ability to detect CO, this leaves occupants critically vulnerable during any type of CO exposure incident. Their life safety is entirely at the mercy of circumstances they have no knowledge of and no control over, assuming a risk they did not choose to take.

Building and business owners rely on guidance from this code to provide basic life safety provisions for occupants. States rely on guidance from this code to pass safety legislation. People rely on this code to stay safe and keep their families safe from preventable death and harm. Emergency responders rely on this code to keep them safe from unnecessary risk in performing their already hazardous jobs.

Please act to protect people from unnecessary death and injury by approving this proposal to provide a baseline level of safety from carbon monoxide danger in all occupancies.

2021 IFC – Chapter 1 Scope and Administration

101.3 Intent.

The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Bibliography: SUPPORT DOCUMENTS FOUND AT THE FOLLOWING LINK

- **https://thejenkinsfoundation.com/category/ifc-2024-proposal-support-do**cuments/

- Swimming Pool CO Incident Log
- Toxicological Profile for Carbon Monoxide - Agency for Toxic Substances & Disease Registry, CDC
- Development of a Technical Basis for Carbon Monoxide Detector Siting, NFPA Fire Protection Research Foundation, 2007
- 2020 Fire Code New York State
- Diffusion of Carbon Monoxide Through Gypsum Wallboard, Neil Hampson, MD
- Carbon Monoxide Poisoning, Lindell Weaver, MD, 2020
- Hotel/Motel CO Incident Log 1967-to date, Jenkins Foundation
- Commercial Building CO Incidents, Jenkins Foundation
- CO Detection and Alarm Requirements: Literature Review, NFPA Fire Protection Research Foundation, 2021
- Cost of Accidental Carbon Monoxide Poisoning: A Preventable Expense, Preventive Medicine Reports, 2016
- CO Incidents - NFIRS (National Fire Incident Reporting System) Data - REM Risk
- Carbon Monoxide Poisonings in Hotels and Motels: The Problem Silently Continues, Prev. Medicine Reports, 2019
- Carbon Monoxide Poisoning at Hotels, Motels and Resorts, Amer. Journal of Prev. Medicine, 2007
- NEMA - Life Fire Safety - Carbon Monoxide

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction but is crucial for life safety.

F102-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that it is proposing an all-encompassing requirement to put carbon monoxide alarms everywhere without statistical data for all these other occupancies than what is currently covered in the code. Additionally, it was noted that the expansion of carbon monoxide detection throughout all the different occupancies will have very little impact to the majority of the deaths due to carbon monoxide poisoning since 54% of carbon monoxide deaths occurred in a home and over 60% of carbon monoxide poisoning deaths were due to suicide. The current minimum requirements in the IFC and IBC are helping to continue to reduce these incidents, but the leading cause is in education of the general public, increasing the cost of construction requiring these devices is not going to provide much benefit as increasing education will. An apology was given to everybody who spoke about their losses and as stated it is an awful thing to happen but the incidents that were presented were in occupancies that, the overwhelming majority, are already required by the IBC and IFC to have these devices and in existing buildings which are also already required to have these devices. Several states, including New Jersey and Washington, were discussed by the committee as examples of jurisdictions that already had specific requirements in place. In closing it was stated that this proposal is a good start in a good direction, and the committee applauded the proponents that put the proposal together. (Vote: 12-0)

F102-21

Individual Consideration Agenda

Public Comment 1:

IFC: CHAPTER 9, SECTION 915, 915.1, 915.1.1, 915.1.2, 915.1.3, 915.1.4, 915.1.5, 915.1.6, 915.2, 915.2.1, 915.2.2, 915.2.3, 915.2.4, 915.2.4 (New), 915.2.5 (New), 915.2.6 (New), 915.3, 915.3.1 (New), 915.3.2 (New), 915.3.3 (New), 915.3.4 (New), 915.4, 915.4.1, 915.4.2, 915.4.3, 915.4.4, 915.4.4 (New), 915.4.5, 915.5, 915.5.1, 915.5.2, 915.5.3, 915.5.4 (New), 915.6, 915.6.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

SECTION 915 CARBON MONOXIDE DETECTION .

915.1 General . Carbon monoxide detection shall be installed in new buildings in accordance with ~~Sections~~ Section 915.1.1 . ~~through 915.6~~. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.

Exception: Carbon monoxide detection is not required in Group S, Group F and Group U occupancies that are not normally occupied.

915.1.1 Where required . Carbon monoxide detection shall be installed ~~provided in Group A, B, E, F, H, I, M, and R occupancies~~ in the locations specified in Section 915.2 where any of the following conditions ~~in Sections 915.1.2 through 915.1.6~~ exist.

1. In buildings that contain a CO source.
2. In buildings that contain or are supplied by a CO producing forced-air furnace
3. In buildings with attached *private garages*
4. In buildings that have a CO producing vehicle that is used within the building

~~**915.1.2 Fuel-burning fireplaces.**~~
~~Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies that contain a fuel-burning fireplace.~~

~~**915.1.3 Fuel-burning forced-air furnaces.**~~
~~Carbon monoxide detection shall be provided in the following locations served by a fuel-burning, forced-air furnace:~~

1. ~~In a central or otherwise approved location in each HVAC zone on every floor level that is served by a fuel-burning forced air-furnace.~~
2. ~~In dwelling units, sleeping units, classrooms in Group E occupancies and areas containing a swimming pool that are served by a fuel-burning forced-air furnace.~~

~~**Exception:** Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.3, Items 1 or 2, where a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an *approved* onsite location or to an approved off-premises location in accordance with NFPA 72.~~

~~**915.1.4 Fuel-burning appliances.**~~
~~Carbon monoxide detection shall be provided in the following locations in buildings that contain fuel-burning appliances:~~

1. ~~In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that contain a fuel-burning appliance.~~
2. ~~In rooms, areas, dwelling units, sleeping units and classrooms in Group E occupancies that have communicating openings between the fuel-burning appliance and the room, area, dwelling unit, sleeping unit or classroom; or in an approved location between the fuel-burning appliance and the room, area dwelling unit, sleeping unit or classroom.~~
3. ~~In dwelling units, sleeping units, classrooms in Group E occupancies, and areas containing a swimming pool.~~

~~**Exception:** Carbon monoxide detection shall not be required to be installed in accordance with Section 915.1.4, Item 3, where a carbon monoxide detector is provided in each room, area, dwelling unit, sleeping unit, or classroom in Group E occupancies that shares a common wall, ceiling or floor with the room or area containing the fuel-burning appliance, and the carbon monoxide alarm signals are automatically transmitted to an approved onsite location or to an off-premises location in accordance with NFPA 72.~~

~~**915.1.5 Private garages.**~~
~~Carbon monoxide detection shall be provided in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies in buildings with attached private garages.~~

~~**Exceptions:**~~

1. ~~Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E~~

~~occupancies without communicating openings between the private garage and the room, area, *dwelling unit*, *sleeping unit* or classroom.~~

2. ~~Carbon monoxide detection shall not be required in rooms, areas, *dwelling units*, *sleeping units* and classrooms in Group E occupancies located more than one story above or below a private garage.~~
3. ~~Carbon monoxide detection shall not be required where the private garage connects to the building through an *open-ended corridor.*~~
4. ~~Where a carbon monoxide detector is provided in an *approved* location between openings to a private garage and rooms, areas, *dwelling units*, *sleeping units* or classrooms in Group E occupancies.~~

~~**915.1.6 Exempt garages.** For determining compliance with Section 915.1.5, an open parking garage complying with Section 406.5 of the International Building Code or an enclosed parking garage complying with Section 406.6 of the International Building Code shall not be considered a private garage.~~

915.2 Locations . ~~Where required by Section 915.1.1, carbon~~ Carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.6 ~~915.2.~~.

915.2.1 Dwelling units . Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a ~~fuel-burning appliance~~ CO source is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units . Carbon monoxide detection shall be installed in *sleeping units*.

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a ~~fuel-burning appliance~~ CO source and is not served by a carbon monoxide producing forced-air furnace.

~~**915.2.3 Areas containing a swimming pool.**~~
~~Carbon monoxide detection shall be installed in areas containing a swimming pool.~~

~~**Exception:** Where there is a conflict between the requirements of this code and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.~~

~~**915.2.4**~~ **915.2.3 Group E occupancies .** A ~~Carbon~~ carbon monoxide system that utilizes carbon monoxide detectors shall be installed in ~~classrooms~~ in Group E occupancies. Alarm signals from ~~Carbon~~ carbon monoxide detectors ~~alarm signals~~ shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception:
Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an *occupant load* of 30 or less.

915.2.4 CO producing forced-air furnace .
Carbon monoxide detection, complying with Item 2 of Section 915.1.1 shall be installed in all enclosed rooms and spaces served by a fuel-burning, forced-air furnace.

Exceptions:

1. Where a carbon monoxide detector is provided in the first room or space served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.
2. Dwelling units that comply with Section 915.2.1.

915.2.5 Private garages .
Carbon monoxide detection, complying with Item 3 of Section 915.1.1, shall be installed within enclosed occupiable rooms or spaces that are contiguous to the attached private garage.

Exceptions:

1. In buildings without communicating openings between the private garage and the building.
2. In rooms or spaces located more than one story above or below a private garage.
3. Where the private garage connects to the building through an open-ended corridor.
4. An open parking garage complying with Section 406.5 of the International Building Code or an enclosed parking garage complying with Section 406.6 of the International Building Code shall not be considered a private garage.
5. Dwelling units that comply with Section 915.2.1.

915.2.6 All other occupancies .
For locations other than those specified in Section 915.2.1 through 915.2.5, carbon monoxide detectors shall be installed on the ceiling of enclosed rooms or spaces containing CO producing devices or served by a CO source forced-air furnace.

Exception: Where environmental conditions prohibit the installation of carbon monoxide detector in an enclosed room or space, carbon monoxide detectors shall be installed in an approved contiguous enclosed location to the room or space that contains a CO source.

915.3 Carbon monoxide detection . Carbon monoxide detection required by Sections 915.1 through ~~915.2.4~~ 915.2.6 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

915.3.1 Alarm limitations. .
Carbon monoxide alarms shall only be installed in dwelling units and in sleeping units. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

915.3.2 Fire alarm system required .
New buildings that are required by Section 907.2 to have a fire alarm system and where carbon monoxide detectors are required by Section 915.2, they shall be connected to the fire alarm system in accordance with NFPA 72.

915.3.3 Fire alarm systems not required .
New buildings that are not required by Section 907.2 to have a fire alarm system, carbon monoxide detection shall be provided by one of the following:

1. Carbon monoxide detectors connected to an approved carbon monoxide detection system in accordance with NFPA 72.
2. Carbon monoxide detectors connected to an approved combination system in accordance with NFPA 72.
3. Carbon monoxide detectors connected to an approved fire alarm system in accordance with NFPA 72.
4. Where approved by the fire code official, carbon monoxide alarms are permitted to be installed where maintained in accordance with the manufacturer's instructions.

915.3.4 Installation .
Carbon monoxide detection shall be installed in accordance with NFPA 72 and the manufacturer's instructions.

915.4 Carbon monoxide alarms . Carbon monoxide alarms shall comply with Sections 915.4.1 through ~~915.4.5~~ 915.4.4.

915.4.1 Power source . Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception:
Where installed in buildings without commercial power, battery-powered carbon monoxide alarms ~~powered by a 10-year battery~~ shall be an acceptable alternative.

915.4.2 Listings . Carbon monoxide alarms shall be *listed* in accordance with UL 2034.

~~**915.4.3 Locations.**~~
~~Carbon monoxide alarms shall only be installed in *dwelling units* and in *sleeping units*. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.~~

~~**915.4.4**~~ **915.4.3 Combination alarms .** Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be *listed* in accordance with UL 217 and UL 2034.

915.4.4 Interconnection .
Where more than one carbon monoxide alarm is required to be installed, carbon monoxide alarms shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms. Physical interconnection of carbon monoxide alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

~~**915.4.5 Installation requirements.**~~
~~Where required by Sections 915.1.1 through 915.5.3, carbon monoxide alarms shall be installed in accordance with Sections 915, NFPA 72, and the manufacturer's installation instructions. Where there is a conflict between the requirements of this code, NFPA 72, and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.~~

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

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

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

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

915.5.4 Occupant Notification .
Activation of a carbon monoxide detector shall annunciate at the control unit and shall initiate audible and visible alarm notification throughout the building.

Exception: Occupant notification is permitted to be limited to the area where the carbon monoxide alarm signal originated and other signaling zones in accordance with the fire safety plan provided the alarm signal from an activated carbon monoxide detector is automatically transmitted to an *approved* on-site location or off-premises location.

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

915.6.1 Enclosed parking garages . Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with Section 404.1 of the International Mechanical Code shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.

Commenter's Reason: This is the first of three related public comments encompassing proposal F102-21 and proposal F116-21. This first public comment is meant to reorder the original proposed change, and address language concerns expressed by the committee.
The intent of the public comment is to require CO detection anywhere that a Carbon Monoxide Producing Device is present. The public comment will allow for either a CO detection system, or CO alarms. The proponent realizes that the cost of a full system might be cost prohibitive. In this vein, the intent is to allow for the following alternatives.

1. Permit the use of standalone CO alarms where there is no fire alarm system present
2. The addition of CO detectors (With notification) in places where a Fire Alarm System is already present
3. The addition of CO detectors attached to security systems that an occupant may have. (As allowed by NFPA 72)

This public comment reorders section 915 so that it first addresses under what circumstances CO detection is needed. The public comment is designed to cover permanent CO sources, including regularly used vehicles, and not temporary conditions such as floor cleaners that are brought in periodically, or the use of appliances such as BBQ grills that were never intended for indoor use. Similarly, the public comment is not intended to apply to things like candles or gelled alcohol cans used in chaffing dishes. The next part of the public comment specifies where CO detection devices are placed to provide the best protection. The next section deals with the installations themselves, including that the devices must comply with NFPA 72, that they need to be hardwired, and that they are interconnected.

This public comment is needed to address occupant notification because many system designers and code authorities are uncertain if carbon monoxide notification appliances (horns and strobes) are required to be installed throughout the building, like fire alarm notification appliances, or if occupant notification can be limited to specific rooms, areas, or spaces. The public comment provides clear language in the Code that carbon monoxide notification appliances are permitted, but not required, to be installed throughout the building and specifies the selective occupant notification locations. The proposed revisions are consistent with similar requirements included in Section 23.8.6.1.2 of the 2019 edition of NFPA 72.

In discussions with opponents, the cost of installation is a concern. The total installed cost of a CO detector in a commercial occupancy that already has an alarm system is approximately $325 per detector. This includes the device, a sounder base, conduit, conductors and the installation labor. A larger occupancy not already required to have CO detection under current code might require 5-6 devices, whereas smaller occupancies might only require 1 or 2. On the other hand, lawsuits from deaths and injuries due to CO poisoning have routinely settled in the millions of dollars. For example, a 2010 settlement with employees of Ruth's Chris Steakhouse cost the company $34 million. 2 devices installed for less than $1000 would have saved them the settlement, and more importantly would have prevented the injury to begin with. This also doesn't cover the lost business time from the original incident or the cost of defending the lawsuit. CO detectors and alarms are an effective way to alert occupants to the presence of CO before they become sick, or die from the exposure and is relatively inexpensive compared to other fire protection systems and the associated costs of having an incident.

Another point of contention is that CO alarms are not listed for use in all occupancies, and this public comment allows for Fire Code Official to allow their use. Currently, the scope of the UL product standard for CO alarms does not list CO alarms for use outside of dwelling units/sleeping units. However, putting a requirement in the code should not be predicated upon a UL product standard allowing it. Rather, the UL standard should test to what the code requires. An implementation several years out, UL will be able to adjust their standard, or create a new one to address the issue. The fact of the matter is that a CO alarm will detect CO regardless of the occupancy class, and a procedural issue does not change that.

We know that these devices are extremely effective at preventing CO injuries and deaths. We also know that this is something that the code can have an immediate effect on, and many states, including New York and New Jersey already have laws requiring CO detection in all occupancies where CO can accumulate.

Lastly, it is not the intent of this public comment to address temporary situations like equipment brought in for a specific maintenance task, nor is it intended to address temporary conditions like heating in tents or other special event structures that do not have permanent CO producing devices. This will be addressed in a future code change proposal in another cycle.

To avoid confusion, what follows is how the text would appear if approved:

SECTION 915 CARBON MONOXIDE DETECTION.

915.1 General. Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1. Carbon monoxide detection shall be installed in existing buildings in accordance with Section 1103.9.

Exception: Carbon monoxide detection is not required in Group S, Group F and Group U occupancies that are not normally occupied.

915.1.1 Where required. Carbon monoxide detection shall be installed in the locations specified in Section 915.2 where any of the following conditions exist.

1. In buildings that contain a CO source.

2. In Buildings that contain or are supplied by a CO producing forced-air furnace

3.In buildings with attached *private garages*

4. In buildings that have a CO producing vehicle that is used within the building

915.2 Locations. Carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.6.

915.2.1 Dwelling units. Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a CO source is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units*.

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a CO source and is not served by a carbon monoxide producing forced-air furnace.

915.2.3 Group E occupancies. A carbon monoxide system that utilizes carbon monoxide detectors shall be installed in in Group E occupancies. Alarm signals from carbon monoxide detectors shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception: Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an *occupant load* of 30 or less.

915.2.4 CO producing forced-air furnace. Carbon monoxide detection, complying with Item 2 of Section 915.1.1 shall be installed in all enclosed rooms and spaces served by a fuel-burning, forced-air furnace.

Exceptions:

1. Where a carbon monoxide detector is provided in the first room or space served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.

2. Dwelling units that comply with Section 915.2.1.

915.2.5 Private garages. Carbon monoxide detection, complying with Item 3 of Section 915.1.1, shall be installed within enclosed occupiable rooms or spaces that are contiguous to the attached private garage.

Exceptions:

1.In buildings without communicating openings between the private garage and the building.

2. In rooms or spaces located more than one story above or below a private garage. 3 . Where the private garage connects to the building through an open-ended corridor. 4. An open parking garage complying with Section 406.5 of the International Building Code or an enclosed parking garage complying with Section 406.6 of the International Building Code shall not be considered a private garage. 5. Dwelling units that comply with Section 915.2.1.

915.2.6 All other occupancies. For locations other than those specified in Section 915.2.1 through 915.2.5, carbon monoxide detectors shall be installed on the ceiling of enclosed rooms or spaces containing CO producing devices or served by a CO source forced-air furnace.

Exception: Where environmental conditions prohibit the installation of carbon monoxide detector in an enclosed room or space, carbon monoxide detectors shall be installed in an approved contiguous enclosed location to the room or space that contains a CO source.

915.3 Carbon monoxide detection. Carbon monoxide detection required by Sections 915.1 through 915.2.6 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

915.3.1 Alarm limitations. Carbon monoxide alarms shall only be installed in dwelling units and in sleeping units. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

915.3.2 Fire alarm system required. New buildings that are required by Section 907.2 to have a fire alarm system, where carbon monoxide detectors are required by Section 915.2 they shall be connected to the fire alarm system in accordance with NFPA 72.

915.3.3 Fire alarm systems not required. New buildings that are not required by Section 907.2 to have a fire alarm system, carbon monoxide detection shall be provided by one of the following:

1. Carbon monoxide detectors connected to an approved carbon monoxide detection system in accordance with NFPA 72.

2. Carbon monoxide detectors connected to an approved combination system in accordance with NFPA 72.

3. Carbon monoxide detectors connected to an approved fire alarm system in accordance with NFPA 72.

4. Where approved by the fire code official, carbon monoxide alarms are permitted to be installed where maintained in accordance with the manufacturer's instructions.

915.3.4 Installation. Carbon monoxide detection shall be installed in accordance with NFPA 72 and the manufacturer's instructions.

915.4 Carbon monoxide alarms. Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.4.4.

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception: Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.

915.4.2 Listings. Carbon monoxide alarms shall be *listed* in accordance with UL 2034.

915.4.3 Combination alarms. Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be *listed* in accordance with UL 217 and UL 2034.

915.4.4 Interconnection. Where more than one carbon monoxide alarm is required to be installed, carbon monoxide alarms shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection

of carbon monoxide alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

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

915.5.1 General. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

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

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

915.5.4 Occupant Notification. Activation of a carbon monoxide detector shall annunciate at the control unit and shall initiate audible and visible alarm notification throughout the building.

Exception: Occupant notification is permitted to be limited to the area where the carbon monoxide alarm signal originated and other signaling zones in accordance with the fire safety plan provided the alarm signal from an activated carbon monoxide detector is automatically transmitted to an *approved* on-site location or off-premises location.

915.6 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 72 . Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.**915.6.1 Enclosed parking garages.** Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with Section 404.1 of the International Mechanical Code shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.

This Public Comment 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: FCAC.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction The overall proposal will increase the cost of construction but it is hoped that this Public Comment will make it more clear where such protection is needed and may reduce the overall cost.
In occupancies not already required to have CO detection, the cost of installing new devices attached to a system is approximately $325 per device, with many occupancies only requiring 4-6 devices for larger occupancies, and 1-2 devices for smaller occupancies.

In places where a stand-alone alarms are allowed by the proposal, the cost of a new device will cost between $25 and $60 per device.

Public Comment# 2807

Public Comment 2:

IFC: (New); IBC: (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

CARBON MONOXIDE SOURCE . A piece of commonly used equipment or permanently installed appliance, fireplace or process that produces or emits carbon monoxide gas.

2021 International Building Code

CARBON MONOXIDE SOURCE . A piece of commonly used equipment or permanently installed appliance, fireplace or process that produces or emits carbon monoxide gas.

Commenter's Reason: This is the second of 3 related proposals. This proposal simply adds a definition for Carbon Monoxide Source. This will clarify that only permanently installed or used sources in a building such as gas fired heaters or propane powered forklifts that are part of the daily operations of a space are included, and that things like candles and floor polishers are not intended to be captured. Additionally, this shortens the code language so that not every iteration of something that produces CO is written in several places in the code.
This Public Comment 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: FCAC.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The overall proposal will increase the cost of construction. This PC is merely adding a new definition to the IFC and IBC to clarify how the provisions are intended to apply. This PC in and of itself does not further impact cost as it is only a definition.

Public Comment# 2808

F103-21

Proposed Change as Submitted

Proponents: Thomas Daly, HSCG - representing the HSCG, representing HSCG (thomas.daly@myhscg.com)

2021 International Fire Code

Add new definition as follows:

LIVING AREA. Spaces in Group R-1 occupancies and R-2 dormitories that are contiguous to one or more sleeping units that include provisions for eating and living and can include furnishings for sleeping purposes. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered living spaces.

Revise as follows:

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units* , including within their contiguous living area(s).

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.

2021 International Building Code

Add new definition as follows:

LIVING AREA. Spaces in Group R-1 occupancies and R-2 dormitories that are contiguous to one or more sleeping units that include provisions for eating and living and can include furnishings for sleeping purposes. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered living spaces.

Revise as follows:

[F] 915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units* , including within their contiguous living area(s).

Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced air furnace.

Reason: Then intent of the Proposal is to provide occupants of Group R-1 hotels and Group R-2 Dormitories with the same level of protection from exposure to carbon monoxide as they do from the dangers of fire. The Proposal requires carbon monoxide detection in spaces intended to be used for sleeping purposes such as living rooms of hotel guestrooms and suites and multi-room dormitories.The IFC, NFPA 101 and NFPA 72 currently require smoke detection in the bedroom and living room. The same requirements are needed for carbon monoxide detection. The Proposal is needed to because many system designers and code authorities are unclear if carbon monoxide detection is required in non-bedroom areas that are used for sleeping. The Proposal provides clear language that all sleeping spaces within shall be provided with the carbon monoxide detection. In typical Group R-1 all-suite hotels, occupants of the bedroom must exit thru the living area to reach the exit corridor. Non-fire CO exposures from within or without the guest suite can and have produced harmful levels of CO with the occupants not warned as the living area is normally separated from the bedroom by a closed door.

Cost Impact: The code change proposal will increase the cost of construction
The cost impact, where it occurs, is estimated at $50 per unit installed. Note however that provisions of the 2021 IFC Sec. 915.1.4 Exception 2 obviates the need for CO detection in dwelling and sleeping units where such detection is provided in rooms and spaces with fuel-fired appliances.

F103-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that there is not anything wrong with the section and adding these extra definitions which are also talking about living spaces is just making it more confusing. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IFC: 915.2.2 (New); IBC: [F] 915.2.2

Proponents: Bryan Holland, representing National Electrical Manufacturers Association (bryan.holland@nema.org); Megan Hayes, representing NEMA (megan.hayes@nema.org) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

915.2.2 Sleeping units . Carbon monoxide detection shall be installed in sleeping units. Where the sleeping area is in a separate room from other spaces within the sleeping unit, the carbon monoxide detection shall be located within the sleeping area and outside each sleeping area within 21 ft (6.4 m) of any door to a sleeping room, with the distance measured along a path of travel.

~~**Exception:** Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the sleeping unit where the sleeping unit or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.~~

2021 International Building Code

[F] 915.2.2 Sleeping units . Carbon monoxide detection shall be installed in *sleeping units*. Where the sleeping area is in a separate room from other spaces within the sleeping unit, the carbon monoxide detection shall be located within the sleeping area and outside each sleeping area within 21 ft (6.4 m) of any door to a sleeping room, with the distance measured along a path of travel.

~~**Exception:** Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.~~

Commenter's Reason: This public comment to Proposal F103-21 meets the objective the original submitter was attempting to achieve and provides more precise language for clarity and enforceability. The new language being proposed ensures that CO detection is provided in the sleeping area itself as this is where the greatest risk of exposure will occur, but also adds a second CO detection location immediately outside of the sleeping area as this space is often used for sleeping (pull-out couches and roll-away beds). However, unlike the current exception, it keeps the CO detection in the sleeping unit and within 21 ft of the designated sleeping area. This better aligns the IFC with the NFPA 72 that is the source of 21 ft criteria and that does not have a similar exception for sleeping units.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Approval of this public comment will result in at least one additional carbon monoxide (CO) alarm within the sleeping units of buildings.

Public Comment# 2515

F107-21 Part I

Proposed Change as Submitted

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

THIS IS A TWO PART CODE CHANGE. PART I OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE MEANS OF EGRESS CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new text as follows:

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

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

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

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

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

Reason: The code currently lacks provisions for the regular maintenance, testing, and record keeping for arguably one of the most common fire code violations an inspector may come across. The added language in 1032.4 mirrors language already in the code for other exit appurtenances [ie: emergency lighting]. Clearly ascertainable exits are paramount in an emergency situation. There shall be no ambiguity how to quickly and safely egress from a building in a time of critical need.
Section 1032.4.1.1, this section addresses a pervasive problem the working group has tried to address in photoluminescent exit signs. Photoluminescence is a process whereby luminescence is induced by the absorption of visible light. The use of photoluminescent exit signage in a low light areas [ie: movie theatres] has presented a problem where minimal or no ambient light is available to recharge the sign. The code lacks adequate means to address photoluminescent exit signs.

Section 1032.4.2.1, accounts for future technology and automated smart building advances. There is no additional financial impact for administering this code.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is related to the testing, inspection and maintenance of existing systems and is within the intent of the code to be addressed.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that the language "immediately discernible" is subjective and not enforceable language and internally illuminated exit signs are designed to last for years and a monthly inspection of these devices including the documentation is a significant labor effort. It was additionally noted that the preference was for the section requirements to be separated out into a list. (Vote: 13-0)

F107-21 Part I

Individual Consideration Agenda

Public Comment 1:

IFC: 1032.4.1, 1032.4.1.1, 1032.4.2

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1032.4.1 Internally illuminated exit signs . Electrically powered, self-luminous and photoluminescent exit signs shall be maintained in accordance with ~~Sections 1032.4.1.1 and 1032.4.1.2.~~ the manufacturer's instructions.

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

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

Commenter's Reason: In response to committee comments the language was revised to clarify the intent to require regular testing of exit signs as a critical component of the means of egress. Reference to “immediately discernable” was removed as being unenforceable and potentially confusing.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code proposal is related to ongoing testing and inspection after construction so has no impact to the original construction.

Public Comment# 2503

Public Comment 2:

IFC: 1032.4.1.1, 1032.10.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

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

otherwise impaired. Signs are to be immediately discernable from the route of egress.

1032.10.1 Activation test . Emergency lighting equipment shall be tested ~~monthly~~ quarterly for a duration of not less than 30 seconds. The test shall be performed manually or by an automated self-testing and self-diagnostic routine. Where testing is performed by self-testing and self-diagnostics, a visual inspection of the emergency lighting equipment shall be conducted monthly to identify any equipment displaying a trouble indicator or that has become damaged or otherwise impaired.

Commenter's Reason: The testing frequency was adjusted to reflect the overall reliability of exit signage and emergency lighting. Monthly testing is not necessary and reflects the concern of the IFC Committee. Emergency lighting is added to this proposal as the testing frequencies should be consistent.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction Technically this is cost of inspection versus construction but this PC will reduce the frequency of necessary inspections and likely reduce the cost of regulation.

Public Comment# 2541

NOTE: F107-21 PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

F107-21 Part II

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

Reason: The code currently lacks provisions for the regular maintenance, testing, and record keeping for arguably one of the most common fire code violations an inspector may come across. The added language in 1032.4 mirrors language already in the code for other exit appurtenances [ie: emergency lighting]. Clearly ascertainable exits are paramount in an emergency situation. There shall be no ambiguity how to quickly and safely egress from a building in a time of critical need.
Section 1032.4.1.1, this section addresses a pervasive problem the working group has tried to address in photoluminescent exit signs. Photoluminescence is a process whereby luminescence is induced by the absorption of visible light. The use of photoluminescent exit signage in a low light areas [ie: movie theatres] has presented a problem where minimal or no ambient light is available to recharge the sign. The code lacks adequate means to address photoluminescent exit signs.

Section 1032.4.2.1, accounts for future technology and automated smart building advances. There is no additional financial impact for administering this code.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is related to the testing, inspection and maintenance of existing systems and is within the intent of the code to be addressed.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved because "immediately discernable" is vague. This is already addressed in Sections 1032.4 and 1013.1. This could be read to force a relocation of exit signs. (Vote: 13-0)

F110-21

Proposed Change as Submitted

Proponents: China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov)

2021 International Fire Code

Add new text as follows:

1032.12 Capacity of means of egress.
The occupant load of buildings or portions thereof shall not exceed the approved capacity of the means of egress.

Reason: We are proposing this addition to the 2021 IFC to make it clear that the occupant load of an existing building is prohibited from exceeding the approved capacity of the means of egress. Other Sections of the 2021 IFC, including but not limited to Section 1004.5.1, provide that the occupant load is allowed to be increased from the values of Table 1004.5. This may mislead code users to believe that the load is permitted to be increased without regard to the approved capacity of the means of egress. This change will make the intent explicitly clear.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The intention of this proposal is to add clarification to provisions that already exist, it should not impact cost.

F110-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that this language is necessary and the code already gives some discretion in the instance that occupant load is going to be exceeded and the fire code official needs to take into consideration the egress requirement as part of it. (Vote: 13-0)

F110-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1032.12

Proponents: China Clarke, representing New York State Dept of State (china.clarke@dos.ny.gov); Kevin Duerr-Clark, representing New York State Department of State (kevin.duerr-clark@dos.ny.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1032.12 Capacity of means of egress . ~~The~~ Unless otherwise provided in this code the occupant load of buildings or portions thereof shall not exceed the *approved* capacity of the *means of egress*.

Commenter's Reason: The comments received stated that the new section is inconsistent with the allowances made for occupant load provided in Section 1004, and does not accommodate the authority granted to a fire code official by the same section. In response, we direct your attention to the use of the phrase “approved capacity” in the proposal, which means the capacity is “acceptable to the fire code official” (as defined in Chapter 2 of the 2021 IFC). We have modified the proposal’s language to include “unless otherwise provided in this code” and italicized the word *approved* to make it explicitly clear that the proposal does not intend to negate the authority granted by other sections of the code, as well as a fire code official’s authority to modify occupancy load or contradict any other provision of the code.
In response to opposition to the placement of the new language within the code we would like to offer the following: The application of the proposed section is for existing buildings that are not undergoing construction; therefore, it is placed in section 1032, not in Section 1004 or Chapter 11. Multiple editions of the IFC commentary (2018 and 2015 IFC) explain that scoping provisions of Section 1001.1 restrict the applicability of Sections

1003 through 1031 to new construction thus leaving only Section 1032 to apply to existing buildings. These same Commentaries say that the scoping provisions of Chapter 11 provide minimum construction requirements for existing buildings.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As the intent of the proposal is to add clarification to provisions that already exist, it will not impact cost of construction.

Public Comment# 2777

F111-21

Proposed Change as Submitted

Proponents: John Catlett, J.D. Catlett Consulting, LLC, representing BOMA International (catlettcodeconsulting@gmail.com); Dan Buuck, National Association of Home Builders, representing National Association of Home Builders (dbuuck@nahb.org)

2021 International Fire Code

CHAPTER 11
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 1101
GENERAL

1101.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements where such existing buildings do not comply with the minimum requirements of the *International Building Code*.

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code.

1101.3 Permits. Permits shall be required as set forth in Sections 105.5 and 105.6 and the *International Building Code*.

Revise as follows:

1101.4 Owner notification. When a building is found to be in noncompliance with this chapter, the *fire code official* shall duly notify the *owner* of the building. ~~Upon receipt of such notice, the *owner* shall, subject to the following time limits, take necessary actions to comply with the provisions of this chapter.~~

Add new text as follows:

1101.4.1 Owners responsibility.
Upon receiving notice as required in Section 1101.4, the building *owner* is required to provide a systematic plan of correction and documentation to support a compliance path based on the provisions of section 1101.4.2 within a timeframe established by the *fire code official*. The *fire code official* is authorized to request additional documentation to support *owner's* proposed schedule.

1101.4.2 Establishing a systematic plan of correction.
Upon receipt of such notice, the owner shall take necessary actions to establish a systematic plan of correction to comply with the provisions of this chapter. The *fire code official* shall evaluate the plan submitted and provide approval of the plan if the fire code official finds the terms acceptable. When developing the plan, the *fire code official* and building *owner* shall agree to a compliance path based on all of the following:

1. The number of provisions of Chapter 11 of this code the owner has been cited to comply with.
2. Any planned alterations within the building where work required to comply with the provisions of Chapter 11 of this code and the *International Existing Building Code* where work can be incorporated into the compliance path schedule.
3. Any disruption of business operations that occurs within the building during construction required to comply with Chapter 11 of this code that must be addressed that will lengthen time for completion or cause work to be performed outside of normal business operations.
4. The number of buildings under the *owner's* control that have to comply with provisions of Chapter 11 of this code.
5. The *owner's* availability to have funding available to complete the work.
6. Availability of necessary design professionals and contractors to design and conduct the work.

Revise as follows:

~~**1101.4.1**~~ **1101.4.3 Construction documents.** *Construction documents* necessary to comply with this chapter shall be completed and ~~submitted within a time schedule~~ in accordance with systematic plan of correction *approved* by the *fire code official*.

~~**1101.4.2**~~ **1101.4.4 Completion of work.** Work necessary to comply with this chapter shall be completed ~~within a time schedule~~ in accordance with the systematic plan of correction *approved* by the *fire code official*.

~~**1101.4.3**~~ **1101.4.5 Extension of time.** The *fire code official* is authorized to grant necessary extensions of time where it can be shown that the specified time periods are not physically practical or pose an undue hardship and the owner has shown a good faith effort to comply with the approved systematic plan of correction. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of ~~an~~ a revised acceptable systematic plan of correction that is approved by ~~with~~ the *fire code official*.

Reason: This code proposal is intended to address the lack of direction to fire code officials regarding seeking compliance with chapter 11 of the

IFC. The code has been silent in addressing the realities and difficulties that retrofitting requirement compliance place on building owners. Unlike new construction, change of use, or alterations where regulatory compliance can be factored into project budgets, retrofitting is not part of a building's maintenance and operations budget and can create a hardship. Building owners are often confronted with violation notices for compliance with Chapter 11 items from field inspectors who treat the requirements the same as a routine violation like exit light maintenance, replacing a noncompliant lock, or unblocking an exit. We can provide examples of where this has already occurred. The lack of realization that many of the items have significant cost associated with them, the lack of available designers and contractors needed to meet demand to do the work necessary to comply with a notice, and sometimes the inability to comply safely without disruption of business operations, is not recognized with short time period notices.
BOMA fully supported the 2021 code change that required a fire sprinkler retrofit for existing high-rise structures because it contained a very acceptable one year to submit a plan for compliance and a ten year from that point to complete the work. This allowed the process of applying the IEBC through alterations and change of use projects to comply with retrofit provisions over a period of time and then completing remaining areas.

Why this is important:

Building owners are normally considered cash cows that are sitting on massive reserves of funds. This is far from the truth. Even small ownership entities have business plans that have to take in staffing cost, overhead from taxes and utilities, disruptions of normal business activities such as what occurred with the Covid pandemic, and both budgeted and unbudgeted maintenance cost. They operate on a cash flow based on occupancy rates of space. Receiving a short compliance period for very expensive safety enhancements without funding from grants, tax deductions or credits can be financially difficult, many times requiring the diversion of intended preventative maintenance funds, reserves for unintended maintenance cost, or actually being required to take loans to accomplish the work. This, in turn adds cost to the end user in the form of higher rents and places the building owner in a very precarious situation of keeping rents in line with regional rental rates.

We need to understand that these buildings are not inherently unsafe. If they were, they would be subject the unsafe building provisions of both the fire and property maintenance codes. Many of the buildings were built under building codes in effect at the time of construction that have been enhanced over time. In no way should chapter 11 be applied as if an emergency, unsafe condition or event has occurred. To be palatable, chapter 11 should be applied as a partnership between the building owner and the fire official.

The proposed code change attempts to accomplish this. It brings forth the elements that need to be considered from the building owner's perspective when issued a notice of violation to comply with Chapter 11. In addition, it recognizes code changes to the brought into the 21' IEBC that makes specific reference to compliance with IFC Chapter 11.

We floated this to various entities that may have interest in this proposal. We received very good feedback and suggestions of methods to accomplish the intent. One proposed that the administrative portion of the code be modified to address the concern. This still is an option, but Chapter 11 is the only section of the code unique by requiring retrofitting and also containing its own administrative provisions for application. Others recommended establishing a chart with minimum compliance thresholds which has merit. However, no size fits all. For example, two years to change out non self-illuminating, back-up power emergency lighting and exit signs for a single five story building may be palatable. But having to do it in five, thirty story towers may be a strain.

We feel it best that the fire code official remains the ultimate decider, but by working with the building owner to understand their needs when developing a plan to make the building compliant. This takes time. Time to secure contractors and designers to develop plans, get cost estimates, and secure funding without disruption of cash flow. Especially during busy construction cycles when new buildings reduce the capabilities to access these professionals that are working on much larger projects.

Compliance sometimes requires the additional cost of having work performed when buildings are closed from daily operations. Drilling and sounds generated from construction, contractors needing access to occupied spaces, and the potential to create unsafe construction related issues (Blocked corridors and stairways, etc.) occurs when buildings are occupied. This adds expense to any project as contractors add to cost estimates the real cost of working outside of a normal day.

Some offered that we may need a companion code change to establish a definition of the term "systematic plan of correction". However, this term has already been used in section 1101.4.3 of Chapter 11 in previous codes. We note that this is the only place in the code where it occurs. This proposal only expands what appears to be a term understood by users in previous code cycles into other provisions of Chapter 11.

Building owners face uncertain times. Demand for office space is anticipated to decline at least for the short term as companies are reducing cost by shedding office space. Although this is anticipated to reverse in coming years, it may be the new norm as companies resistant to remote working were forced into it by the pandemic. Now that it has proven effective and remote meeting technology has improved, this could be more than a trend.

In addition, building owners are facing unprecedented pressure to shoulder the burden of energy efficiency beyond what they can expect as a return on investment. States and localities are moving legislation that will require retrofitting of existing HVAC equipment that currently use fossil fuels to higher efficiency electric or renewable energy equipment. The combination of energy compliance, IFC chapter 11 compliance, and the reduced need for office space has a potential to be disastrous to the office building and multi-family residential rental market. This code proposal allows for the continuous movement toward *safer* buildings while realizing the associate cost, hurdles, and disruption compliance can entail.

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

The proposal does not increase or decrease the cost of compliance. It will allow building owners to prepare for the cost.

F111-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved with several concerns. Generally, it was felt that the focus was on economic impact versus safety. The approach lacks flexibility and does not recognize concepts such as a fire watch. The list of items addressed seems limiting and may reduce the authority of the fire code official. It was suggested that perhaps a reference back to Section 112 would be more appropriate and perhaps the conditions in Section 1101.4.2 should be eliminated. (Vote: 13-1)

F111-21

Individual Consideration Agenda

Public Comment 1:

IFC: CHAPTER 11, SECTION 1101, 1101.1, 1101.2, 1101.3, 1101.4, 1101.4.1 (New), 1101.4.2 (New), 1101.4.1, 1101.4.2, 1101.4.3

Proponents: John Catlett, representing BOMA International (catlettcodeconsulting@gmail.com) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

CHAPTER 11
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 1101
GENERAL

1101.1 Scope . The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code.

1101.2 Intent . The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements where such existing buildings do not comply with the minimum requirements of the *International Building Code*.

1101.3 Permits . Permits shall be required as set forth in Sections 105.5 and 105.6 and the *International Building Code*.

1101.4 Owner notification . When a building is found to be in noncompliance with this chapter, the *fire code official* shall duly notify the *owner* of the building. Upon receipt of such notice, the *owner* shall, ~~subject to the following time limits, take necessary actions to comply with the provisions of this chapter.~~ contact the fire code official within 30 days to establish a plan of correction.

1101.4.1 Owner's responsibility .
The building owner is required to provide a plan of correction and documentation to support a compliance path based on the provisions of section 1101.4.2 within a timeframe agreed to by the fire code official. The fire code official shall request documentation from the owner to support owner's proposed schedule.

1101.4.2 Establishing a plan of correction .
Upon receipt of such notice, the owner shall take necessary actions to establish a plan of correction noting designer and contractor availability, budget and financial considerations, the number of items to be complied with from Chapter 11, and the anticipated number of buildings under the owner's control that must be brought into compliance. The owner shall also include upcoming planned building alterations subject to the provisions of the *International Existing Building Code* that can incorporate the provisions of Chapter 11 that must be brought into compliance. Once the plan is approved by the fire code official, it shall be subject to the provisions of Section 110 of this code.

~~**1101.4.1**~~ **1101.4.3 Construction documents .** *Construction documents* necessary to comply with this chapter shall be completed and ~~submitted within a time schedule~~ in accordance with the plan of correction *approved* by the *fire code official*.

~~**1101.4.2**~~ **1101.4.4 Completion of work .** Work necessary to comply with this chapter shall be completed ~~within a time schedule~~ in accordance with

the plan of correction *approved* by the *fire code official*.

~~1101.4.3~~ **1101.4.5 Extension of time .** The *fire code official* is authorized to grant necessary extensions of time where it can be shown that the specified time periods are not physically practical or pose an undue hardship , and the owner has shown a good faith effort to comply with the approved plan of correction. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of ~~an~~ a revised~~acceptable systematic~~ plan of correction that is approved by ~~with~~ the *fire code official*.

Commenter's Reason: The Fire Code Committee was sympathetic to the original proposal and we received several offers to help craft this public comment from committee members and those who testified.
This code proposal is intended to address the lack of direction to fire code officials seeking compliance with chapter 11 of the IFC. Unlike new construction, change of use, or alterations where regulatory compliance can be factored into project budgets, retrofitting is not part of a building's maintenance and operations budget and can create a hardship both financially and practically with respect to building occupants and contractor availability.
Existing building owners are often confronted with violation notices for compliance with Chapter 11 items from field inspectors who treat the requirements similarly to a routine violation such as exit light maintenance, replacing a noncompliant lock, or unblocking an exit. Frequently, the following are not given adequate recognition: cost, availability of design professionals and contractors, disruption of business operations, possible need to perform the work during non-business hours, etc.
BOMA fully supported the 2021 code change that required a fire sprinkler retrofit for existing high-rise structures because we were able to negotiate a realistic one-year timeframe for plan submittal and a ten-year timeframe for implementation. In addition, several federal tax law changes were made that allowed building owners to amortize the cost over a fifteen-year period for tax relief.

Why this is important:

Building owners are normally considered cash cows that are sitting on massive reserves of funds. This is far from the truth. Even small ownership entities have business plans that have to take in staffing cost, overhead from taxes and utilities, snow and ice removal, disruptions of normal business activities such as what occurred with the Covid pandemic or long term disaster events, and both budgeted and unbudgeted maintenance cost. They operate on a cash flow based on occupancy rates of rented space.
Building owners have multiple considerations to take into account when establishing budgets: staffing costs, utilities, taxes, regular maintenance, and unplanned repairs to name a few. Receiving a short compliance period for very expensive safety enhancements without funding from grants, tax deductions or credits can be financially difficult, often requiring the diversion of intended preventative maintenance funds, reserves for unintended maintenance cost, or a need to take loans to accomplish the work. This, in turn adds cost to the end user in the form of higher rents and the building owner is faced with balancing increases to cover expenses with regional rental rates.

The ICC Government relations staff provided the Industry Advisory Committee an informal finding of survey of localities that enforce the provisions of Chapter 11. Many states and localities prohibit retrofitting provisions either entirely or they can only be applied as part of a planned building alteration or change of use subject to the International Existing Buildings Code. In fact, the country was split almost 50/50 percent on where these provisions are being enforced.

It is important to understand that these buildings are not inherently unsafe. If they were, they would be subject to the unsafe provisions of Section 111 of this code and property maintenance codes.

Many of the buildings were built under earlier building codes and have been enhanced over time. Chapter 11 should not be applied as if an emergency or unsafe condition has occurred. To be realistic and achievable, Chapter 11 should be applied as a partnership between the building owner and the fire official.

The proposed code change attempts to accomplish this. It brings forth the elements that need to be considered from the building owner's perspective when issued a notice of violation with respect to Chapter 11. In addition, it recognizes code changes brought into the 2021 IEBC that make specific reference to compliance with IFC Chapter 11.
Building owners face uncertain times. Demand for office space is anticipated to decline at least for the short term as companies are reducing cost by shedding office space and remote work is more widespread. In addition, building owners are facing unprecedented pressure to shoulder the burden of energy efficiency beyond what they can expect as a return on investment. States and localities are moving legislation that will require retrofitting of existing HVAC equipment that currently use fossil fuels to higher efficiency electric or renewable energy equipment. The combination of energy compliance, IFC chapter 11 compliance, and the reduced need for office space has a potential to be disastrous to the office building and multi-family residential rental market. The intent of Chapter 11 is to improve buildings to more recent improvements in building safety. It is not intended to make an unsafe building safe. As Chapter 111 provides. This code proposal allows for the continuous movement toward safer buildings while realizing the associate costs, practical challenges, and potential disruption that compliance can entail.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change provides a clearer path to compliance with Chapter 11. Cost will not change. But planning for the cost of compliance can be budgeted and planned for.

Public Comment# 2985

F116-21

Proposed Change as Submitted

Proponents: Kris Hauschildt, representing self (krishauschildt@yahoo.com)

2021 International Fire Code

Revise as follows:

1103.9 Carbon monoxide detection. Carbon monoxide detection shall be installed in existing Group A, B, E, F, H, I, M ~~I-1, I-2, I-4~~ and R occupancies in accordance with Section 915. ~~and in classrooms in Group E occupancies where those units include any of the conditions identified in Sections 915.1.2 through 915.1.6. The carbon monoxide alarms shall be installed in the locations specified in Section 915.2 and the installation shall be in accordance with Section 915.4.~~

~~**Exceptions:**~~

1. ~~Carbon monoxide alarms are permitted to be solely battery operated where the code that was in effect at the time of construction did not require carbon monoxide detectors to be provided.~~
2. ~~Carbon monoxide alarms are permitted to be solely battery operated in *dwelling units* that are not served from a commercial power source.~~
3. ~~A carbon monoxide detection system in accordance with Section 915.5 shall be an acceptable alternative to carbon monoxide alarms.~~

Reason: This proposal seeks to establish uniform baseline requirements for CO detection in all occupancies with permanently installed fuel-burning appliances, fuel-burning fireplaces or attached garages. CO poisoning incidents resulting in deaths and injuries continue to happen with alarming regularity in occupancies not covered by the current IFC as well as those that are, demonstrating that current code requirements are not adequately inclusive and are not effectively targeting problem areas within specific occupancies.
The suggested revisions contained in this proposal are based on *"Development of a Technical Basis for CO Detector Siting," "Diffusion of CO Through Gypsum Wallboard,"* the New York State Fire Code which has required CO detection in all commercial occupancies since 2015, and data from individual case examples (see attachments and bibliography).

Requiring CO detection in all occupancies that contain known CO hazards will prevent an untold number of deaths and injuries.

Substantiation for Uniform Baseline Requirements for CO detection in All Occupancies

The lethality of CO is undisputed. The severity of poisoning injury depends not only on the level and duration of CO exposure, but also on the individual. Those most at risk from the effects of CO: infants and children, older people, pregnant women/unborn babies, and those with underlying health conditions. There is no formula that can accurately predict how CO will impact a particular person nor what level or duration of exposure can be tolerated without suffering prolonged harm, irreversible brain damage, or death. For many victims who survive a CO exposure, the effects do not end with the poisoning incident. They can be severe enough to cause death weeks to months later. They can also cause irreversible effects, including life-altering brain injury.

"In addition to the immediate onset effects of exposure, delayed-onset development of neuropsychiatric impairment typically occurs from several days to approximately 3–4 weeks after exposure, with symptoms including inappropriate euphoria, impaired judgment, poor concentration, memory loss, cognitive and personality changes, psychosis, and Parkinsonism. Symptoms of acute carbon monoxide poisoning in children are the same as those in adults. Acute carbon monoxide poisoning during pregnancy has been associated with spontaneous abortion and fetal death."

- Agency for Toxic Substances & Disease Registry, CDC

The lifesaving value of CO detection is undisputed. CO detection has been commercially available for at least 30 years and has proven reliability. There is no substitute for the early detection that these devices provide, alerting to danger before conditions escalate to a level of causing harm. In the absence of detection, it is the building occupants who are providing the alert to CO leaks, becoming ill or dying before building staff are even aware there is a problem. Some examples:

2013, North Carolina: My parents both died in a **hotel** room from a CO leak while they were on vacation. They lost consciousness and lay helpless all night, inhaling poison for over 14 hours until they died. No one in the building was even aware they were in danger. There was no CO detection onsite despite there being gas fireplaces in the guest rooms, a gas pool heater, gas dryers and gas water heaters. First responders (EMS, police, fire dept) suspected CO but thought it was more likely they both died of heart attacks so didn't bother to test the room, opting instead to wait weeks for autopsy toxicology results. The leak continued for another seven weeks, killing an 11-year-old boy and causing permanent injury to his mother in the same room before it was finally detected. Multiple people were ill at the hotel during those seven weeks, including guests and a repairman servicing the elevator which was located next to the leaking exhaust system.

2017, Michigan: A 13-year-old boy at a spring break swim party with his friends died on the deck of a **swimming pool** from CO leaking from a pool heater in an adjacent room. His friends suffered CO injury as well as head injuries when they lost consciousness and fell onto the concrete pool deck. An employee along with multiple firefighters suffered CO injuries responding to the incident.

** There is specific concern over the number of incidents in **indoor swimming pool areas** that have resulted in poisoning injuries to children. CO exposure in a pool also leads to an increased risk of drowning. These incidents are detailed on the attached spreadsheet.

2014, New York: A **restaurant** manager died from CO leaking from a fuel burning appliance in the room adjacent to his office. The assistant manager lost consciousness and suffered CO injury when she went looking for him. Multiple rescue personnel became injured as well when they rushed in to render aid, unaware they were entering a CO contaminated environment. 24 people were hospitalized including restaurant patrons. The manager had reportedly been ill for weeks prior, but neither he nor his doctors suspected it as being CO-related.

1995, California: A woman and her husband were poisoned in a **hotel** room, not found until 36 hours later – he died, she survived with permanent injury to her brain, so severe she was prevented from ever being able to work or live independently again. 25 years later, she lives in a specialized group home.

2006, Maryland: 20 **restaurant** workers suffered long term brain injury after being exposed to a CO leak that had gone unnoticed for weeks and progressed to a level of 700ppm in the dining area before problem was discovered.

2019, Ohio: CO leak at **correctional facility** caused poisoning injuries to 4 staff and 29 inmates

2019, Illinois: CO leak at a **dry cleaners**, 3 people taken to the hospital including a police officer

2019, Utah: 60 people were poisoned at a **church** from CO leaking from a boiler, having spent several hours breathing in CO levels measured at 200-500ppm. Many were projected to have long term health effects.

2021, Nebraska: 10 people poisoned at a **bowling alley**, 4 hospitalized.

According to NFIRS (National Fire Incident Reporting System) data, there were a total of 10,715 CO incidents in hotels/motels, churches, restaurants/cafeterias, bars/taverns, and K-12 schools between 1999 and 2018. This is a minimum number. Participation in the NFIRS system is voluntary and not all fire departments participate.

Further, deaths and injuries are occurring even in buildings equipped with CO detection, demonstrating the need for occupancy specific focus for future improvements beyond a baseline requirement:

2017, Texas: A couple was poisoned and found unconscious in their hotel room from CO leaking from a pool heater. The hotel was equipped with unmonitored CO detection. A couple staying a few doors down had removed the batteries from the CO alarm in their room after it had gone off multiple times during the night. The couple found unconscious later died of their CO related injuries.

2018, Tennessee: Several people were poisoned in a hotel exercise room, located on a floor with a pool but no guest rooms. The hotel reportedly had CO detection, but only on floors with guest rooms.

2019, Illinois: A couple was poisoned in their hotel room equipped with a CO alarm that was alarming, but a hotel maintenance worker told them to disregard the alarm. They ended up calling the fire department themselves and were treated at a hospital for CO poisoning.

As a homeowner it is a reasonable expectation to be aware of the hazards of CO and take responsibility to install CO detection to protect yourself. However, as an occupant of a building that is under someone else's charge, there is no way to know of equivalent hazards nor whether action has been taken to install safeguards. Combined with no human ability to detect CO, this leaves occupants critically vulnerable during any type of CO exposure incident. Their life safety is entirely at the mercy of circumstances they have no knowledge of and no control over, assuming a risk they did not choose to take.

Building and business owners rely on guidance from this code to provide basic life safety provisions for occupants. States rely on guidance from this code to pass safety legislation. People rely on this code to stay safe and keep their families safe from preventable death and harm. Emergency responders rely on this code to keep them safe from unnecessary risk in performing their already hazardous jobs.

Please act to protect people from unnecessary death and injury by approving this proposal to provide a baseline level of safety from carbon monoxide danger in all occupancies.

2021 IFC – Chapter 1 Scope and Administration

101.3 Intent.

The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Bibliography: **SUPPORT DOCUMENTS FOUND AT THE FOLLOWING LINK**

- **https://thejenkinsfoundation.com/category/ifc-2024-proposal-support-do**cuments/

- Swimming Pool CO Incident Log
- Toxicological Profile for Carbon Monoxide - Agency for Toxic Substances & Disease Registry, CDC
- Development of a Technical Basis for Carbon Monoxide Detector Siting, NFPA Fire Protection Research Foundation, 2007
- 2020 Fire Code New York State
- Diffusion of Carbon Monoxide Through Gypsum Wallboard, Neil Hampson, MD
- Carbon Monoxide Poisoning, Lindell Weaver, MD, 2020
- Hotel/Motel CO Incident Log 1967-to date, Jenkins Foundation
- Commercial Building CO Incidents, Jenkins Foundation
- CO Detection and Alarm Requirements: Literature Review, NFPA Fire Protection Research Foundation, 2021
- Cost of Accidental Carbon Monoxide Poisoning: A Preventable Expense, Preventive Medicine Reports, 2016
- CO Incidents - NFIRS (National Fire Incident Reporting System) Data - REM Risk
- Carbon Monoxide Poisonings in Hotels and Motels: The Problem Silently Continues, Prev. Medicine Reports, 2019
- Carbon Monoxide Poisoning at Hotels, Motels and Resorts, Amer. Journal of Prev. Medicine, 2007
- NEMA - Life Fire Safety - Carbon Monoxide

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction, but it is crucial for life safety.

F116-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved for the same reasons as expressed in F102-21. It was encouraged for some instances in existing buildings to look beyond allowing simply battery operated alarms and potentially to require connection to building power. Additionally the proponent is encouraged to bring this proposal and F102-21 back during the public comment phase. (Vote: 12-0)

F116-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1103.9

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

1103.9 Carbon monoxide detection . Carbon monoxide detection shall be installed in existing buildings ~~Group I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies~~ where ~~those units include~~ any of the conditions identified in ~~Sections 915.1.2 through 915.1.6~~ Section 915.1.1 exist. ~~The carbon~~ Carbon monoxide alarms shall be installed in the locations specified in Section 915.2 and the installation shall be in accordance with Section 915.4.

Exceptions:

1. Carbon monoxide alarms are permitted to be solely battery operated where the code that was in effect at the time of construction did not require carbon monoxide detectors to be provided.

2. Carbon monoxide alarms are permitted to be solely battery operated in *dwelling units* that are not served from a commercial power source.

3. A carbon monoxide detection system in accordance with Section 915.5 shall be an acceptable alternative to carbon monoxide alarms.

Commenter's Reason: This is the third code change for CO detection, and is a companion to F102-21.
The intent of this proposal is to require CO detection be retroactively installed in accordance with Chapter 9. This is arguably the most important change, as older buildings will be more likely to generate CO than a new occupancy with new appliances that have been recently installed.This proposal/public comment is intended to work hand in hand with the PC to F102-21 submitted by FCAC.

This Public Comment 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: FCAC.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The overall proposal will increase the cost of construction but it is hoped that this PC will make it more clear where such protection is needed and may reduce the overall cost increase. The exact cost will vary by occupancy type. Occupancies already required to have these intallations will not be affected.

Public Comment# 2811

F117-21 Part I

Proposed Change as Submitted

Proponents: Cole Graveen, Structural Engineer, representing Self

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART II OF THIS PROPOSAL WILL BE HEARD BY THE PROPERTY MAINTENANCE & ZONING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

1104.6 Guards. Guards complying with this section shall be provided at the open sides of *means of egress* that are more than 30 inches (762 mm) above the floor or grade below.

Revise as follows:

1104.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards shall not be required to be higher than required by the adopted building code.
1. ~~1.~~ 2. Existing guards on the open side of exit access and exit stairways and ramps shall be not less than 30 inches (760 mm) high.
2. ~~2.~~ 3. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. ~~3.~~ 4. Existing guards in assembly seating areas.

Reason: This is the second of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between the IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This second proposal adds an exception to the required guard height in both the IFC and the IPMC. As a note to the ICC code committee reviewing this proposal, if both proposals are approved, the intent is for 307.1, Exception 2, to be placed as an exception to new section 307.2.1 as 307.2.1 addresses the guard height. This proposal adds a logical exception to the required existing guard height in both the IFC and the IPMC. Existing guards should not be retroactively required to be higher than the guard height permitted for new construction per the IBC or the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the required height for existing guards. It may decrease costs in jurisdictions that retroactively require an increase in guard heights, but most likely it does not impact the cost of construction.

Public Hearing Results

This proposal includes published errata

https://cdn-web.iccsafe.org/wp-content/uploads/2021-GROUP-A-CONSOLIDATED-MONOGRAPH-UPDATES-Updated-4-02-2021-complete.pdf

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as it was consistent with the action on Part II of the proposal. In addition, the wording "adopted building code" is confusing and the scope of Section 1104.1 appears to address already. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IFC: 1104.6, 1104.6.1

Proponents: Cole Graveen, representing Self (cwgraveen@rrj.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1104.6 Guards . Guards complying with this section shall be provided at the open sides of *means of egress* that are more than 30 inches (762 mm) above the floor or grade below.

1104.6.1 Height of guards . Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

~~1. Existing guards shall not be required to be higher than required by the adopted building code.~~

~~2.~~ 1. Existing guards on the open side of exit access and exit stairways and ramps shall be not less than 30 inches (760 mm) high.

. ~~3.~~ 2. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.

. ~~4.~~ 3. The height of existing ~~Existing~~ guards in assembly seating areas shall be permitted to comply with the *International Building Code*.

Commenter's Reason: The code committee discussion and opposition testimony indicated that the language contained in the proposal was confusing. The modification contained in this public comment removes the proposed new exception and instead revises the text of an existing exception to more clearly indicate what is permitted by the IFC.
There are three exceptions to the minimum guard height of 42 inches. Two of the exceptions provide the lessor height that is permitted in specific locations, however Exception 3 for assembly seating areas does not provide the lessor height that is permitted. In addition, it does not give the user any idea where to find the minimum guard height that is intended by the exception. This can cause confusion as to what lessor height is acceptable per Exception 3.

The proposal revises the text of Exception 3 to specifically point to the IBC to obtain the minimum guard height. The IBC is where guard height requirements for assembly seating areas are contained.

A simple pointer to the IBC is the most straightforward way to clearly indicate what is intended and will not require modification if section numbers change in the future. In the IBC, Section 1015.3 contains the requirements for the height of guards. Exception 4 permits the guard height in assembly seating areas to comply with Section 1030.17. Section 1030.17, specifically Sections 1030.17.2 and 1030.17.3, permit guards in specific locations in assembly seating areas to be a minimum of 26 inches high.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The modification in this public comment is a clarification of existing requirements and will not change the cost of construction.

Public Comment# 2217

F117-21 Part II

Proposed Change as Submitted

Proponents: Cole Graveen, Structural Engineer, representing Self

2021 International Property Maintenance Code

SECTION 307
HANDRAILS AND GUARDRAILS

Revise as follows:

307.1 General. Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards*. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

Exceptions:

1. *Guards* shall not be required where exempted by the adopted building code.

2. Existing *guards* shall not be required to be higher than required by the adopted building code.

Reason: This is the second of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between the IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This second proposal adds an exception to the required guard height in both the IFC and the IPMC. As a note to the ICC code committee reviewing this proposal, if both proposals are approved, the intent is for 307.1, Exception 2, to be placed as an exception to new section 307.2.1 as 307.2.1 addresses the guard height.This proposal adds a logical exception to the required existing guard height in both the IFC and the IPMC. Existing guards should not be retroactively required to be higher than the guard height permitted for new construction per the IBC or the IRC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies the required height for existing guards. It may decrease costs in jurisdictions that retroactively require an increase in guard heights, but most likely it does not impact the cost of construction.

F117-21 Part II

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposal as they felt the language did not match other I-codes (adopted building code vs. at the time of construction) and therefore caused confusion. Further, they felt the requirement should permit lower existing guard installations. Lastly, they felt that the new language seemed to require taller guards than previously allowed. (Vote: 10-1)

F117-21 Part II

Individual Consideration Agenda

Public Comment 1:

IPMC: SECTION 307, 307.1

Proponents: Cole Graveen, representing Self (cwgraveen@rrj.com) requests As Modified by Public Comment

Modify as follows:

2021 International Property Maintenance Code

SECTION 307
HANDRAILS AND GUARDRAILS

307.1 General . Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards*. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

Exceptions:

1. *Guards* shall not be required where exempted by the adopted building code.
2. ~~Existing *guards* shall not be required to be higher than required by the adopted building code.~~ The height of existing *guards* in assembly seating areas shall be permitted to comply with the *International Building Code*.

Commenter's Reason: The code committee discussion and opposition testimony indicated that the language contained in the proposal was confusing. The modification in this public comment revises the text of the new exception to be more clear as to what is permitted.
Currently the IPMC states that guards shall not be less than 30 inches in height. There are no exceptions permitted to the 30 inch minimum height. As such the IPMC conflicts with the IBC which allows guards to be not less than 26 inches in height for portions of assembly seating areas per Section 1030.17 Assembly Guards, specifically Sections 1030.17 .2 and 1030.17.3. Section 1030.17 is directly referenced by the guard height section, Section 1015.3 Height, in Exception 4. Therefore, while a 26 inch height guard in an assembly seating area can be built per the IBC, as soon as the building becomes an existing building, the guard is in violation of the IPMC.

This public comment places an exception to the minimum 30 inch guard height so that assembly seating areas legally built to a height of 26 inches are not in violation of the IPMC.

The original proposal attempted to generically reference the IBC by using the phrase "adopted building code" which is used elsewhere in the IPMC. This would have allowed for any future guard height exceptions to be automatically referenced by the IPMC. However as previously stated that approach was deemed to be confusing.

A simple pointer to the IBC is the most straightforward way to clearly indicate what is intended and will not require modification if section numbers change in the future. In the IBC, Section 1015.3 contains the requirements for the height of guards. Exception 4 permits the guard height in assembly seating areas to comply with Section 1030.17. Section 1030.17, specifically Sections 1030.17.2 and 1030.17.3, permit guards in specific locations in assembly seating areas to be a minimum of 26 high.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change and public comment is essentially a clarification of the intent of the code with regard to the allowable guard height in assembly seating areas.

Public Comment# 2215

F118-21 Part I

Proposed Change as Submitted

Proponents: Cole Graveen, Structural Engineer, representing Self

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE PROPERTY MAINTENANCE & ZONING COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Revise as follows:

1104.6 Guards. ~~Guards~~ *Guards* ~~complying with this section~~ shall be provided along open-sided walking surfaces ~~at the open sides of *means of egress*~~ that are more than 30 inches (762 mm) above the floor or grade below.
Exception: *Guards* shall not be required where exempted by the adopted building code.

1104.6.1 Height of guards. ~~Guards~~ *Guards* shall be ~~form a protective barrier~~ not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing ~~guards~~ *guards* on the open side of *exit access* and exit *stairways* and *ramps* shall be not less than 30 inches (760 mm) high.
2. Existing *guards* within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing *guards* in assembly seating areas.

Reason: This is the first of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between teh IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This first proposal primarily addresses the editorial differences, however it does address one technical difference.

IFC Changes

The text in 1104.6 is editorially changed to A) remove the “complying with this section” phrase as it is unnecessary and B) to use the phrase “along open-sided walking surfaces” to match the phrase used in the IBC, Section 1105.2, and the IRC, Section R312.1.

The text in 1104.6.1 is editorially changed to remove the phrase “form a protective barrier” as it is unnecessary and potentially confusing. Section 1104.6.1 addresses the required guard height, not the purpose of a guard. Guard is a defined term in the IFC and the definition includes its purpose. There is no need to rehash the purpose in this section. In addition, the phrase “form a protective barrier” is not part of the definition and could be interpreted by some as an additional requirement for guards in the IFC.

The technical change in this proposal is to add a new exception to Section 1104.6. Adding this exception coordinates the IFC with the IPMC, which already includes this exception. It also logically aligns the requirements for when an existing guard is required with the requirements for when a guard is required for new construction. The IBC has 7 exceptions to the requirement for when guards are to be installed. Locations that are not required to have guards for new construction per the IBC should not retroactively be required to have guards per the IFC (or the IPMC).

IPMC Changes

The requirements for handrails and guards are split into separate sections to match how the requirements are provided in the IFC, the IBC, and the IRC. Using separate sections more clearly indicates the requirements.

The handrail text is modified to delete reference to “exterior and interior” stairs as this text is not needed and is not used in the IFC. Simply using the term “stairs” is sufficient and will require all stairs covered by the code to comply.

The phrase “along open-sided walking surfaces” is added to the Guard section to coordinate with the IBC and the IRC. The list of items, balconies, etc., is left in place even though it is not necessary as it was considered that some may object to removing the list.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is primarily editorial to reorganize and clarify the provisions. It is not expected to impact the cost of construction.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based upon lack of clarity and concern that the building code may actually raise the height of the guard in some cases with the proposed exception. Generally, the exception seems confusing and what is trying to be accomplished is already addressed by the scoping statement in Section 1104.1. It was suggested that perhaps the section could simply be revised to require compliance with the building code at the time of construction. (Vote: 13-1)

F118-21 Part I

Individual Consideration Agenda

Public Comment 1:

IFC: 1104.6, 1104.6.1

Proponents: Cole Graveen, representing Self (cwgraveen@rrj.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1104.6 Guards . *Guards* shall be providedalong open-sided walking surfaces that are more than 30 inches (762 mm) above the floor or grade below.

~~Exception:~~ ~~*Guards* shall not be required where exempted by the adopted building code.~~

1104.6.1 Height of guards . *Guards* shall be not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing *guards* on the open side of *exit access* and exit *stairways* and *ramps* shall be not less than 30 inches (760 mm) high.
2. Existing *guards* within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing *guards* in assembly seating areas.

Commenter's Reason: The code committee's reasons for recommending disapproval were based on the proposed new exception to IFC Section 1104.6. Section 1104.6 provides the requirements for where guards are required in existing buildings. The new exception was proposed because it matched the existing exception to the corresponding section in the International Property Maintenance Code. However due to the code committee's comments, I have removed the new exception from the proposal. The remaining changes are editorial changes which coordinate the text of the IFC with the text used for guards in the IBC, the IRC, and with the IPMC (due to F118-21 Part II which was recommended for approval).
The editorial changes contained in the proposal, which did not raise objections from the code committee, include:

A) The phrase "open-sided walking surfaces" replaces existing IFC text in order to be consistent with the text in the IBC and IRC.

B) The phrase "form a protective barrier" is removed for several reasons. First, this phrase does not appear in the IBC or the IRC. Second, the purpose of the guard is addressed in the definition contained in Section 202 and as such the purpose does not need to also be addressed in Section 1104.6.1 as this section addresses the height of the guard. and Third, the phrase is not used in the definition and therefore the use of the phrase in Section 1104.6.1 could be interpreted by some as an additional requirement for guards in the IFC that is not contained in the IBC, IRC, or the IPMC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The as modified proposal is editorial for coordination with other I-codes and will not effect the cost of construction.

Public Comment# 2205

NOTE: F118-21 PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY

F118-21 Part II

Proposed Change as Submitted

Proponents: Cole Graveen, Structural Engineer, representing Self

2021 International Property Maintenance Code

SECTION 307
HANDRAILS AND GUARDRAILS

Revise as follows:

307.1 ~~General~~ Handrails. ~~Every exterior and interior flight of stairs~~ Stairs having more than four risers shall have a handrail on one side of the stair . ~~and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards*. Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.~~

~~**Exception:** *Guards* shall not be required where exempted by the adopted building code.~~

Add new text as follows:

307.1.1 Height.
Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces.

Revise as follows:

307.2 Guards. *Guards* shall be provided along open-sided walking surfaces, including balconies, porches, decks, stairs, ramps, and landings, that are more than 30 inches (762 mm) above the floor or grade below.

Exception:
Guards shall not be required where exempted by the adopted building code.

307.2.1 Height. *Guards* shall be not less than 30 inches (762 mm) high.

Reason: This is the first of two proposals being submitted on the topic of existing guards. There are requirements for existing guards in both the IFC and the IPMC. The intent of these proposals is to A) Increase the coordination between the IFC and the IPMC on this topic, and B) Increase the coordination between teh IFC and the IPMC with the IBC and the IRC.
In general, there are editorial differences between the IFC, IPMC, and the IBC which include the use of different terms and phrases as well as different organization, which can lead to confusion. There are also technical differences between the IFC and IPMC which creates a conflict when both codes are adopted by a jurisdiction.

This first proposal primarily addresses the editorial differences, however it does address one technical difference.

IFC Changes

The text in 1104.6 is editorially changed to A) remove the “complying with this section” phrase as it is unnecessary and B) to use the phrase “along open-sided walking surfaces” to match the phrase used in the IBC, Section 1105.2, and the IRC, Section R312.1.

The text in 1104.6.1 is editorially changed to remove the phrase “form a protective barrier” as it is unnecessary and potentially confusing. Section 1104.6.1 addresses the required guard height, not the purpose of a guard. Guard is a defined term in the IFC and the definition includes its purpose. There is no need to rehash the purpose in this section. In addition, the phrase “form a protective barrier” is not part of the definition and could be interpreted by some as an additional requirement for guards in the IFC.

The technical change in this proposal is to add a new exception to Section 1104.6. Adding this exception coordinates the IFC with the IPMC, which already includes this exception. It also logically aligns the requirements for when an existing guard is required with the requirements for when a guard is required for new construction. The IBC has 7 exceptions to the requirement for when guards are to be installed. Locations that are not required to have guards for new construction per the IBC should not retroactively be required to have guards per the IFC (or the IPMC).

IPMC Changes

The requirements for handrails and guards are split into separate sections to match how the requirements are provided in the IFC, the IBC, and the IRC. Using separate sections more clearly indicates the requirements.

The handrail text is modified to delete reference to “exterior and interior” stairs as this text is not needed and is not used in the IFC. Simply using the term “stairs” is sufficient and will require all stairs covered by the code to comply.

The phrase “along open-sided walking surfaces” is added to the Guard section to coordinate with the IBC and the IRC. The list of items, balconies, etc., is left in place even though it is not necessary as it was considered that some may object to removing the list.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is primarily editorial to reorganize and clarify the provisions. It is not expected to impact the cost of construction.

F118-21 Part II

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee agreed that this proposal aligns the guard and handrail requirements with other I-codes. Further, separating handrail requirements from guardrail requirements is appropriate.. (Vote: 11-0)

F118-21 Part II

F119-21 Part I

Proposed Change as Submitted

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

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART 2 WILL BE HEARD BY THE BUILDING CODE GENERAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Fire Code

Add new text as follows:

1105.12 Group I-2 Electrical Systems.
Existing electrical systems shall comply with the requirements for existing electrical systems in NFPA 99.

Reason: In order to meet federal conditions of participation health care facilities must comply with system and equipment according to the requirements listed in NFPA 99, Health Care Facilities Code (K912). NFPA 99 is a risk based approach to system design and maintenance of key building systems. It is based upon risk to patients, visitor or staff in the healthcare facility regardless of occupancy classification. It does cover items such as routine testing of both normal and emergency power, testing of electrical systems, defining surgery operating rooms as wet locations unless approved risk assessment determines otherwise. Cover plates on life safety and critical branch receptacles are a distinct color. Requiring tamperproof receptacles in designated pediatric locations. These items are required in both new and existing healthcare facilities depending upon services and risk.These practices improve safety and reliability of electrical systems in locations at risk.
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 change aligns with existing federal requirements for the healthcare industry.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved with a concern that it would be too difficult for existing electrical systems to comply. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IFC: 1105.12

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1105.12 Group I-2 Electrical Systems. ~~Existing~~ In Group I-2 occupancies, existing electrical systems shall comply with the requirements for existing electrical systems in NFPA 99.

Commenter's Reason: The change is based upon concerns raise by the committee. There are only very small sections of Chapter 6 that are applicable to existing buildings. It does cover items such as routine testing of both normal and emergency power, testing of electrical systems, defining surgery operating rooms as wet locations unless approved risk assessment determines otherwise. Cover plates on life safety and critical branch receptacles are a distinct color. Requiring tamperproof receptacles in designated pediatric locations. This change is a part of a series of changes that assure the IFC, IBC and IEBC align with the requirements of CMS facilities regulations. The changes are designed to improve the safety of existing facilities regardless of year constructed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change aligns with existing federal requirements for the healthcare industry.

Public Comment# 2611

F119-21 Part II

Proposed Change as Submitted

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

2021 International Building Code

Add new text as follows:

2701.1.1 Group I-2 Electrical Systems.
Electrical systems shall be installed in accordance with NFPA 99 and Article 517 of NFPA 70.

Reason: In order to meet federal conditions of participation health care facilities must comply with system and equipment according to the requirements listed in NFPA 99, Health Care Facilities Code (K912). NFPA 99 is a risk based approach to system design and maintenance of key building systems. It is based upon risk to patients, visitor or staff in the healthcare facility regardless of occupancy classification. It does cover items such as routine testing of both normal and emergency power, testing of electrical systems, defining surgery operating rooms as wet locations unless approved risk assessment determines otherwise. Cover plates on life safety and critical branch receptacles are a distinct color. Requiring tamperproof receptacles in designated pediatric locations. These items are required in both new and existing healthcare facilities depending upon services and risk.These practices improve safety and reliability of electrical systems in locations at risk.
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:
This change aligns with existing federal requirements for the healthcare industry.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved. If this requirement is for just Group I-2, this needs to be in the text, not just in the title. The committee also asked if this was not sufficiently addressed in Section 2702.2.8 and 407.11 for Group I-2? (Vote: 8-6)

Individual Consideration Agenda

Public Comment 1:

IBC: 2701.1.1

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

2701.1.1 Group I-2 Electrical Systems . In Group I-2 occupancies, electrical ~~Electrical~~ systems shall be installed in accordance with NFPA 99 ~~and Article 517 of NFPA 70 70.~~ .

Commenter's Reason: One of the main points in the hearing was that the requirement was covered by 2702.2.8. (407.11). The scope of both 2702.2.8 and 407.11 is essential electric systems. The provisions in NFPA 99 extend beyond strictly essential electric system into all branches of the electric system. There are requirements for normal power such as tamperproof receptacles in pediatric areas which will include normal power and guidance on power in psychiatric locations in hospitals. This change is a part of a series of changes that assure the IFC, IBC and IEBC align with the requirements of CMS facilities' regulations. NFPA 70 is also applicable as it is required in 2701.1 and NFPA 99.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change aligns with existing federal requirements for the healthcare industry.

Public Comment# 2612

F122-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

Reason: This proposal clarifies that Chapter 12 applies to ESS at installations under the exclusive control of an electric utility, such as the ESS installation involved in an incident in Surprise, AZ. This is consistent with several requirements in Section 1207 that specifically reference ESS used at electric utility facilities.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It just clarifies that Chapter 12 does cover electric utility ESS installations.

F122-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved to ensure that energy storage systems whether under the purview of utilities is regulated no differently than other ESS installations. The hazards remain the same and there is particular concern for emergency responder safety. It should be noted that this is both applicable to public and private utilities. (Vote: 10-4)

F122-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Disapprove

Commenter's Reason: As written, this language is not enforceable, for the following reasons:
-It is contradictory. The new sentence saying that the scope covers "energy storage systems under the exclusive control of an electric utility" is in direct conflict with the last sentence about not applying to equipment under the exclusive control of an electric utility.

-Utility controlled energy storage systems can or will act as energy generation systems. For example, a system that is rated at 100 kW and 400 kWh can replace a 100 kW fossil fuel "peaker" plant during a peak time of electric consumption or to help fill the gaps when the output of other generation is declining.

-Utility controlled energy storage systems can or will act to help control the electric grid, by providing ancillary services or voltage support or frequency control at the transmission level.

-Utility controlled energy storage systems can or will act to help control the electric grid, by providing ancillary services or voltage support or

frequency control at the distribution system level.

Other proposals, such as F123, F124, and F125, provide much better language and do not contain such unenforceable language.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2580

F123-21

Proposed Change as Submitted

Proponents: sharon bonesteel, salt river project, representing salt river project (sharon.bonesteel@srpnet.com)

2021 International Fire Code

Revise as follows:

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

Exception: ESS approved and installed in compliance with NFPA 855.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

855-2020 Standard for the Installation of Stationary Energy Storage Systems

Reason: The NFPA 855 Standard for the Installation of Stationary Energy Storage Systems is a comprehensive standard that provides the minimum requirements for mitigating the hazards associated with ESS. Due to the nature of the fast changing ESS market, the NFPA 855 Standard, which is under continual maintenance process, will be able to address new technologies promptly. It is an appropriate standard to use in lieu of the requirements of Ch.12 of the IFC.

Bibliography: NFPA® 855 Standard for the Installation of Stationary Energy Storage Systems, 2020 Edition, prepared by the Technical Committee on Energy Storage Systems and acted on by the NFPA at its Association Technical Meeting held June 17-20,2019, in San Antonio, TX. It was issued by the Standards Council on August 5, 2019, with an effective date of August25, 2019. This edition of NFPA 855 was approved as an American National Standard on August 25, 2019.
The next edition will be submitted as the reference standard upon completion.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The use of NFPA® 855 as an equivalent standard to Ch.12 of the IFC will not increase or decrease the cost of construction.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F123-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The reference to NFPA 855 should more appropriately be located in Section 1207. Also, there was concern with the current lack of scope in NFPA 855 and the need for the fire code official to easily access the provisions within the IFC. (Vote: 14-0)

F123-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1201.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); Sharon Bonesteel, representing salt river project (sharon.bonesteel@srpnet.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1201.1 Scope . The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency. Energy storage systems regulated by Section 1207 shall comply with this chapter as appropriate and NFPA 855.

~~**Exception:** ESS approved and installed in compliance with NFPA 855.~~

Commenter's Reason: FCAC Reason: Reference to NFPA 855 is appropriate, it was a stated goal as both the IFC and NFPA language was being developed much as we have done with the IFC and NFPA 2. By referencing NFPA 855 the code user picks up details and annex note explanations that are not within the IFC.
Unfortunately the proposal does not provide the correct linkage to NFPA 855 and instead adds it as a separate parallel path. The format for referencing a standard in the IFC is to add that reference in addition to the language contained within the IFC. This modification adds the NFPA 855 reference in the form that is utilized for the other various standard the IFC refers to.Locating this linkage at the beginning of Chapter 12 is correct as other portions of Chapter 12 will apply to ESS based upon their intended use, (emergency or standby power), or form, (hydrogen fuel cell and storage usage as ESS).

This Public Comment 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: FCAC.

Bonesteel Reason:

Reference to NFPA 855 is appropriate as it was a stated goal that it would eventually replace Section 1207. There are items in Section 1207 that are not fully covered in NFPA 855, so by combining the use of both documents during this rapidly changing industry time, maximum safety measures can be obtained. In edition, the code user will benefit from the annex note explanations in NFPA 855, and the opportunity to become familiar with its layout.

FCAC

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The net effect might cause some increase in construction costs by applying additional requirements from NFPA 855. However, there is a chance for decreased costs because the location of this added language informs the user of the need to also comply with other provisions of Chapter 12 avoiding added costs when discovered late in the process. The Annexes of NFPA 855 provide additional guidance and understanding of intent and goals which could also help reduce costs.

Bonesteel

Cost Impact:

The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

Since the provisions in both documents are very similar in content and intent the cost of compliance will not change

Public Comment# 2457

F124-21

Proposed Change as Submitted

Proponents: Sharon Bonesteel, representing salt river project (sharon.bonesteel@srpnet.com)

2021 International Fire Code

Revise as follows:

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

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoe Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

Reason: These emergency back up systems should not be treated as energy storage systems. They have been functioning safely for years, providing back up in substations and other utility facilities. They are used for emergency power for pumps, for switch gear, and other equipment necessary for the safe operation and maintenance of utility facilities. Their installation and use has been safely governed by the IEEE C2 and the additional cost of conflicts in complying with Ch.12 will result in additional costs to the average utility customer, without additional safety being gained.

Cost Impact: The code change proposal will decrease the cost of construction
The additional requirements of Ch.12 for ESS are an additional expense for these systems that are emergency back up power for substations and other utility facilities.

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F124-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This exception is too broad in scope and would remove all regulation. Such an exception needs to be more surgically made within Section 1207 as applicable to each issue. (Vote: 14-0)

F124-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Submitted

Commenter's Reason: The exception is consistent with the language in the last sentence of Section 1201.1. The items listed are under the exclusive control of an electric utility and the equipment is directly associated with generation, control, transmission, or distribution of electric

service.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction These systems will be excepted from the additional requirements in Chapter 12, and their costs will be reduced.

Public Comment# 2637

F127-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

1204.5 Operating locations. Portable generators shall be operated only outdoors a minimum of 5 feet (1524 mm) from any structure with a combustible wall or from any building openings such as windows and doors or air intakes. Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31.

Add new text as follows:

1204.5.1 Generators located at less than 5 feet.
Portable generators shall be permitted to be installed at a distance of less than 5 feet (1524 mm) from a combustible wall, as permitted by NFPA 37, where one of the following applies:

1. The generator has undergone a full scale fire test ,in accordance with NFPA 37, demonstrating that complete consumption of the combustibles in the generator, including its housing and fuel tank, will not ignite combustible structures.
2. The combustible wall exhibits a *fire-resistance rating* of at least one hour.

Add new standard(s) as follows:

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

NFPA 37-2021 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

Reason: The IFC contains a requirement that generators should be placed no closer than 5 feet from openings. That is absolutely excellent. However, NFPA 37 (Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines) also requires that they be placed no closer than 5 feet from combustible walls, with some exceptions. NFPA 37 has now been revised so that the 2021 edition contains a full scale fire test which is used to demonstrate whether a generator can be safely installed at a distance of less than 5 feet, which is actually quite common, in practice, especially in urban environments and with the increased use of generators as backup power.
Experience has shown that fires starting at generators can cause severe destruction in buildings placed in the vicinity, which is why the required minimum distance of 5 feet is a good idea.

The changes to NFPA 37 reflect research that showed that it is possible to forecast whether a generator (which is called an engine in NFPA 37) placed closer than 5 feet can still be installed safely.

NFPA 37 provides three options for safe installation:

1. The nearby wall has a fire resistance rating of at least 1 hour.

2. The generator (engine) and its weatherproof housing (as well as any fuel tank) has undergone a full scale fire test that requires complete consumption of all the combustibles in the generator, and shows that any fire originating in the generator will not ignite the nearby building (with a margin of error added to the distance).

3. Calculations performed under engineering supervision demonstrate that a fire originating at the engine or within its weatherproof housing will not ignite combustible structures.

The annex of NFPA 37 provides guidance for the engineering calculation, using NFPA 555 as the basis for the engineering analysis.

NFPA 37 is already referenced in the IMC and the IFGC. It has been issued by a consensus standards organization (NFPA) and complies with CP 28.

The language in the present (2021) edition of NFPA 37 reads as follows (with the changes from the earlier edition shown in legislative format):

4.1.4 Engines Located Outdoors.

4.1.4.1 Engines and, if provided, their weatherproof housings that are installed outdoors shall be located at least 1.5 m (5 ft) from any openings in the walls of structures.

4.1.4.2 Engines and, if provided, their weatherproof housings that are installed outdoors shall be located at least 1.5 m (5 ft) from structures having combustible walls except as provided in 4.1.4.2.1 ~~or~~ through 4.1.4.2.4.

4.1.4.2.1 A clearance less than 1.5 m (5 ft) shall be permitted where all portions of structures that are closer than 1.5 m (5 ft) from the engine enclosure have a fire resistance rating of at least 1 hour.

4.1.4.2.2 A clearance less than 1.5 m (5 ft) shall be permitted where ~~it has been demonstrated through methods acceptable to the authority having jurisdiction that a fire within the enclosure~~ a fire test involving consumption of the available combustibles, within the engine or, if provided, its weatherproof housing demonstrates that a fire originating at the engine or its weatherproof housing will not ignite combustible structures.*

4.1.4.2.3 If an engine assembly includes a nonrated fuel tank, the testing in 4.1.4.2.2 shall include the fuel tank.

4.1.4.2.4 A clearance less than 1.5 m (5 ft) shall be permitted where calculations performed under engineering supervision demonstrate that a fire originating at the engine or within its weatherproof housing will not ignite combustible structures.

Cost Impact: The code change proposal will increase the cost of construction
The proposal adds a prohibition for generators to be placed near a combustible wall and adds, as an exception, a requirement that, if generators are placed close to a combustible wall they must be fire tested. The IFC has no requirements associated with generators and combustible walls.

Staff Analysis: A review of the standard proposed for inclusion in the code, NFPA 37-2021, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F127-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The language in Section 1204.5 "any structure with a combustible wall or from" may cause confusion as it should simply refer to "a combustible wall or from." A structure could have some walls that are combustible and some that are non combustible. In addition there was concern that reference to a stationary generator standard for portable generators may cause confusion. (Vote: 13-1)

F127-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1204.5, 1204.5.1 (New), 1204.5.1

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1204.5 Operating locations . Portable generators shall be operated only outdoors a minimum of 5 feet (1524 mm) from any ~~structure with a~~ combustible wall or from any building openings such as windows and doors or air intakes. Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31.

1204.5.1 Portable generators in use for 7 days or more .
Portable generators in use for a period of at least 7 days shall be separated from combustible walls in accordance with Section 1204.5 or Section 1204.5.2.

~~**1204.5.1**~~ **1204.5.2 Generators located ~~at~~ less than 5 feet from combustible walls .** Portable generators shall be permitted to be ~~installed~~ located and operated outdoors at a distance ~~of~~ less than 5 feet (1524 mm) from a combustible wall~~, as permitted by NFPA 37,~~ where one of the following applies:

1. The generator has undergone a ~~full scale~~ fire test ,in accordance with NFPA 37, demonstrating that complete consumption of the combustibles in the generator, including its housing and fuel tank, will not ignite combustible structures. There shall be no openings such as windows, doors or air intakes within 5 feet of the generator exhaust.
2. The combustible wall has ~~exhibits~~ a *fire-resistance rating* of at least one hour with no unprotected openings.

Commenter's Reason: This public comment addresses the concerns raised by the committee and the opponent.
1. The language has been changed to refer to combustible walls and not buildings with combustible walls.

2. The language has been changed to indicate that no generator shall be placed near any opening, for protection against carbon monoxide poisoning.

3. The scope of NFPA 37 explains that it applies to portable generators, as long as they are in use for a period of at least one week.

4. Since it is most common for walls to have openings, this prohibits operation of generators within 5 feet of unprotected openings on walls.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The proposal adds fire testing requirements for generators placed close to buildings.

Public Comment# 2361

F132-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

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

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

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

Revise as follows:

TABLE 1207.1.1 ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

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

For SI: 1 kilowatt hour = 3.6 megajoules.

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

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

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

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

d. Covers nonelectrochemical technologies such as flywheel and thermal ESS

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

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

F132-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1207.1.1Utilities and Industrial applications. This section shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities where such equipment complies with section 10.1.4 of the NFPA 855 ~~used in applications such as flexible ac transmission (FACTS) devices, filter capacitor banks, power factor correction, and standalone capacitor banks for voltage correction and stabilization.~~

1207.1.2 Mobile ESS. Mobile ESS deployed at an electric utility substation or generation facility for 90 days or less in accordance with section 1.3.3 of NFPA 855 shall not add to the threshold values in Table ~~1207.1~~ 1207.1.1 ~~for the stationary ESS installation if both of the following conditions apply:~~

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

Add new standard(s) as follows:

NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems

Committee Reason: This proposal was approved as it provides the necessary exceptions to capacitors associate with utilities and industrial facilities in certain applications and short term use of mobile ESS. The modification provide specific references to NFPA 855 to address duplicated language. There was some concern that the table was not consistent with NFPA 855. (Vote: 10-4)

F132-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.1.1, 1207.1.2, TABLE 1207.1.1, 80 NFPA,

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

1207.1.1 Utilities and Industrial applications . This section shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities ~~where such equipment complies with Section 10.1.4 of NFPA 855 855. equpment~~ . used in applications such as flexible ac transmission (FACTS) devices, filter capacitor banks, power factor correction, and standalone capacitor banks for voltage correction and stabilization.

1207.1.2 Mobile ESS . Mobile ESS deployed at an electric utility substation or generation facility for 90 days or less ~~in accordance with Section 1.3.3 of NFPA 855~~ shall not add to the threshold values in Table 1207.1.1 . for the stationary ESS installation if both of the following conditions apply:

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

TABLE 1207.1.1 ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

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

For SI: 1 kilowatt hour = 3.6 megajoules.

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

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

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

d. Covers nonelectrochemical technologies such as flywheel and thermal ESS

~~NFPA~~

~~National Fire Protection Association~~
~~1 Batterymarch Park~~
~~Quincy~~, ~~MA~~ ~~02169-7471~~

,

~~855-2020:~~ ~~Standard for the Installation of Stationary Energy Storage Systems~~

Commenter's Reason: This public comment is focused upon making this proposal along with F134-21 consistent with the following proposals

1. F138-21
2. F140-21
3. F141-21
4. F143-21
5. F144-21
6. F145-21
7. F146-21
8. F151-21
9. F152-21

A direct reference to NFPA 855 was not provided in the listed proposals. The revisions to this proposal through this PC will essentially revise the language back to how it was originally submitted In addition, the table is revised to remove one and two family dwellings as they are not a type of battery technology but a location where such technologies are used. It also corrects a spelling error.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This does not change the outcome as the technical provisions will not change.

Public Comment# 2258

F133-21

Proposed Change as Submitted

Proponents: Emma Gonzalez-Laders, NYS DOS Division of Building Standards and Codes, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); Gregory Benton, representing NYS DOS Division of Building Standards and Codes (gregory.benton@dos.ny.gov); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov); Jeffrey Hinderliter, City of Oswego, representing City of Oswego (jhinderliter@oswegony.org)

2021 International Fire Code

Revise as follows:

1207.1.3 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance ratings* of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 1207.2.1.
10. A decommissioning plan complying with Section 1207.2.3.
11. An emergency response plan, developed in conjunction with the *fire code official*, that includes adequate guidance for mitigating fire, thermal runaway, and explosion hazards.

Reason: The actions taken in the initial minutes of an emergency are critical. A call for help to emergency services that provides full and accurate information helps the dispatcher send the right responders and equipment.[1] When it comes to energy storage systems (ESS), as a relatively new technology, emergency responders have limited knowledge and experience developing mitigation plans and anticipating the hazards they might encounter when responding to an emergency.

The document titled Energy Storage Safety Strategic Plan, prepared by the US Department of Energy in December of 2014, recognized that *"first responders must be included in the discussion to ensure that all areas of potential failure are identified and the best mitigation strategies are developed, spanning the chemistries and materials choices through components, module layouts and deployment."* The document emphasized the need for *"deliberate and concerted effort to engage the first responder community early in the design and siting of energy storage systems so that proper mitigation techniques can be developed and systems* [can be] *designed to improve the overall safety and ability to quickly and safely resolve the incident. This must include the development of techniques to extinguish any fires if they were to occur and respond to the variety of non-fire incidents that may require fire department response, developing site specific training for first responders, improved systems design, and the development of incident response plans. All of these must be based on the scientific understanding of the systems, materials and processes."* The report also highlighted the importance of ensuring that those mechanisms be included as part of the requirements "*in codes, standards and regulations."*[2]

In spite of this clear guidance issued by a reliable source, first responders arrive at the scene of an emergency without this critical information. In March of 2018, after first responders worked for hours to extinguish a deadly electric vehicle fire near Mountain View, California, the vehicle manufacturer dispatched a team of engineers to assist in the removal of the battery pack.[3] As it pertains to buildings, first responders should be able to reasonably anticipate the types of hazards to be encountered prior to being dispatched. Having to wait for a manufacturer or other facility personnel to arrive and provide critical information to successfully address the hazards could result in loss of life, injuries, and loss of property.A report from the UL Firefighter Safety Research Institute included similar recommendations. Prepared after the 2018 fire and explosion at an ESS facility in Sunrise, Arizona, that resulted in injuries to four firefighters, the investigative report was the first of its kind and was issued as part of the Study of Firefighter Line of Duty Injuries and Near Misses. The report included *"recommendations on how to improve codes, standards, and emergency response training to better protect first responders, maintenance personnel and nearby communities."* [4] The report indicated that an Emergency Response Plan was neither required, nor provided to fire service personnel prior to the incident and that the report provided on arrival did not include adequate guidance to mitigate the typical potential hazards to be found at an ESS facility: thermal runaway, fire, and explosion. The burden of preparing the emergency response plan during design and permitting and making it available to the fire code official prior to an incident is minor when compared to the potential to injuries to first responders.

Much of the work and information required for the preparation of an ERP is basically already required under in Item #7 on the same list and code

section (*"details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and deflagration venting systems, if provided"*). Many of the technical aspects required in Item #7 will inform the creation of the emergency response plan.

[1] https://www.ready.gov/business/implementation/emergency

[2] https://www.sandia.gov/ess-ssl/docs/other/DOE_OE_Safety_Strategic_Plan_Dec_2014_final.pdf

[3] https://www.cnet.com/roadshow/news/tesla-model-x-autopilot-crash-fire/ and https://electrek.co/2018/03/23/tesla-fire-battery-pack-model-x-crash/

[4] https://ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html

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Energy Storage Safety Strategic Plan. US Department of Energy. December, 2014. www.sandia.gov/ess-ssl/docs/other/DOE_OE_Safety_Strategic_Plan_Dec_2014_final.pdf. Accessed 12/2/2020.

Hyatt, Kyle. *Tesla Model X Fatal Crash and Fire Under Investigation.* CNET. 03/28/2018. www.cnet.com/roadshow/news/tesla-model-x-autopilot-crash-fire/. Accessed 12/2/2020.

Lambert, Fred. *Tesla Assists in Removing Partially Destroyed Battery Pack After Tragic Fatal Crash Resulted in a Fire. Electrek*. www.electrek.co/2018/03/23/tesla-fire-battery-pack-model-x-crash/Four Firefighters Injured in Lithium-Ion Battery. Accessed 12/2/2020.

McKinnon, Mark B., DeCrane, Sean, and Kerber, Stephen . *Energy Storage System Explosion - Arizona.* UL Firefighter Safety Research Institute. www.ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html. Accessed 12/2/2020.

Emergency Response Planning Checklist. Akita Box. www.home.akitabox.com/emergency-response-planning-checklist-pdf. Accessed 12/2/2020.

Cost Impact: The code change proposal will increase the cost of construction
Any responsible development will likely include some level of hazard mitigation and incident pre-planing at some stage of the project process, regardless. This proposal simply would require that all that information be gathered into a standard Emergency Response Plan (ERP) during design and permitting and be subject to the approval of the fire code official.

Sample checklists for the development of a general Emergency Response Plan can be found online free of charge.[1] Completing the checklist and customizing a plan based on the presence of a lithium-ion battery ESS on the premises will likely require one to three hours depending on the preparer's level of familiarity with and the complexities of the system being used. Where a battery type other than lithium-ion is being proposed, less information is readily available and likely more time will be required. As mentioned in the Reason Statement, some of the research and documentation needed to prepare an ERP will be readily available, since much of the technical information that is already required in Item #7 of the same list and section will form the basis for the creation of the ERP.

Once a plan is developed, the designer or the supplier of the system can use it as the basis for future projects, therefore, the time required to prepare it for subsequent projects will decrease. Likewise, a plan developed for another facility with the same technology and a similar scope can inform the development of a plan for a new facility, also reducing the time required to develop the new plan.

The cost of inaction, when considering the risks to first responders and property losses, far outweighs the cost of pre-planning.

[1] https://home.akitabox.com/emergency-response-planning-checklist-pdf

F133-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This language would be more appropriate for Chapter 4 of the IFC as it relates to preplanning which is done after construction is complete. The proposal seems to be mixing preplanning with a hazardous mitigation analysis which is already required in Section 1207.1.4. It was suggested that perhaps the analysis in Section 1207.1.4 should be required in the construction documents or within the section addressing commissioning. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.1.3, 1207.2.2, 1207.2.2.1, 1207.2.2.2 (New), NFPA Chapter 80 (New)

Proponents: Robert Davidson, representing Self (rjd@davidsoncodeconcepts.com); Chad Sievers, representing NYS Dept. of State (chad.sievers@dos.ny.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1207.1.3 Construction documents . The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance ratings* of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 1207.2.1.
10. A decommissioning plan complying with Section 1207.2.3.
11. ~~An emergency response plan, developed in conjunction with the *fire code official*, that includes adequate guidance for mitigating fire, thermal runaway, and explosion hazards.~~

1207.2.2 Operation and maintenance . An operation and maintenance manual shall be provided to both the ESS *owner* or their authorized agent and the ESS operator before the ESS is put into operation and shall include the following:

1. Manufacturer's operation manuals and maintenance manuals for the entire ESS, or for each component of the system requiring maintenance, that clearly identify the required routine maintenance actions.
2. Name, address and phone number of a service agency that has been contracted to service the ESS and its associated safety systems.
3. Maintenance and calibration information, including wiring diagrams, control drawings, schematics, system programming instructions and control sequence descriptions, for all energy storage control systems.
4. Desired or field-determined control set points that are permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.
5. A schedule for inspecting and recalibrating all ESS controls.
6. A service record log form that lists the schedule for all required servicing and maintenance actions and space for logging such actions that are completed over time and retained on-site.

The ESS shall be operated and maintained in accordance with the manual and a copy of the manual shall be retained at an approved on-site location.

1207.2.2.1 Ongoing inspection and testing . Systems that monitor and protect the ESS installation shall be inspected and tested in accordance with the manufacturer's instructions and the operation and maintenance manual. Inspection and testing records shall be maintained in the operation and maintenance manual.

1207.2.2.2 Emergency planning and training .
Emergency planning and training complying with Section 4.1.3.2 of NFPA 855 shall be provided. The emergency operations plan associated with the required emergency planning and training shall be submitted to the fire code official for review and approval.

NFPA

National Fire Protection Association
1 Batterymarch Park

Commenter's Reason: Emergency planning and training is essential for sites with installed energy storage systems. Early, coordinated and effective response to potentially dangerous conditions involving the ESS is critical to keep an incident small through quick mitigation.
The committee's decision to disapprove the original submittal is correct from the standpoint as to location of the requirement. The topic is not related to construction submittals, it is directly related to operations and maintenance. This public comment relocates the requirement to a new subsection under Section 1207.2.2 Operation and maintenance. Detailed requirements for Emergency planning and training including an emergency operations plan is already provided for in NFPA 855 and this proposed language requires that the Emergency planning and training section of that document be complied with.4.1.3 Emergency Planning and Training.

NFPA 855-2020

4.1.3.1* General. Emergency planning and training shall be provided by the owner of the ESS or their authorized representative so that ESS facility operations and maintenance personnel and emergency responders can effectively address foreseeable hazards associated with the on-site systems.

4.1.3.2 Facility Staff Planning and Training. An emergency operations plan and associated training shall be established, maintained, and conducted by ESS facility operations and maintenance personnel.

4.1.3.2.1 Emergency Operations Plan.

4.1.3.2.1.1 An emergency operations plan shall be readily available for use by facility operations and maintenance personnel.

4.1.3.2.1.2 For normally occupied facilities, the emergency operations plan shall be on site.

4.1.3.2.1.3 The plan shall be updated when conditions that affect the response considerations and procedures change.

4.1.3.2.1.4 The emergency operations plan shall include the following:
(1) thru (8)...

To see the remaining details requirements NFPA 855 is publicly accessible at:
https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/List-of-Codes-and-Standards

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This requirement is not related to construction (installation) of the ESS, it is related to operations and maintenance. As a result it does not impact construction costs, though it will increase operational costs.

Public Comment# 2758

Public Comment 2:

IFC: 1207.1.3, 404.1

Proponents: Emma Gonzalez-Laders, representing NYS DOS Division of Building Standards and Codes (emma.gonzalez-laders@dos.ny.gov); Gregory Benton, representing NYS Department of State (gregory.benton@dos.ny.gov); Chad Sievers, representing NYS Department of State (chad.sievers@dos.ny.gov); Paul Rogers, representing International Association Firefighters (timjoepaul@yahoo.com) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

1207.1.3 Construction documents . The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance ratings* of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.

6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 1207.2.1.
10. A decommissioning plan complying with Section 1207.2.3.
11. ~~An emergency response~~ A fire safety and evacuation plan in accordance with Section 404. ~~, developed in conjunction with the *fire code official*, that includes adequate guidance for mitigating fire, thermal runaway, and explosion hazards.~~

404.1 General . Where required by Section 403 or by other sections of this code, fire safety, evacuation and lockdown plans shall comply with Sections 404.2 through 404.4.1.

Commenter's Reason: As noted in the original proposal, the need to "*engage the first responder community early in the design and siting of energy storage systems"* was noted in the 2014 DOE Energy Storage Safety Strategic Plan.

Similar recommendations were included in a report from the UL Firefighter Safety Research Institute prepared after the 2018 fire and explosion at an ESS facility in Sunrise, Arizona.
In spite of that clear guidance, first responders continue to arrive at the scene of an emergency without critical information on the "major fire hazards associated with the normal use and occupancy" likely to be encountered in an ESS facility. A list of "major fire hazards associated with the normal use and occupancy" is required to be included as part of a fire safety and evacuation plan in item #5 of Section 404.2.2.

During the Spring hearings, the committee indicated that this pre-planning "language would be more appropriate for Chapter 4 of the IFC," therefore, we're proposing to revise our original proposal to simply include a reference to Section 404. However, since Section 404 only applies "where required by Section 403," we're also proposing to expand the scope of 404.1 to include other locations where the Fire Code so requires. This is consistent with the language used in Sections 508.1 and 5005.1.3.

The committee also suggested that "perhaps the [hazard mitigation] analysis in Section 1207.1.4 should be required in the construction documents." However, in accordance with Section 1207.1.4, a hazard mitigation analysis is only required for a few unusual instances and does not give the fire code official the opportunity to weigh in on the majority of installations. For this reason, we are not proposing any modifications based on that specific recommendation at this time.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Any responsible development will likely include some level of fire safety and evacuation pre-planing at some stage of the project process, regardless. This proposal simply would require that the information be gathered during design and permitting and be subject to the approval of the fire code official.

Completing the plan for a lithium-ion system using information readily available will likely require one to three hours depending on the preparer's level of familiarity with and the complexities of the system being used. Where a battery type other than lithium-ion is being proposed, less information is readily available and likely more time will be required. As mentioned in the Reason Statement for the original proposal, some of the research and documentation needed to prepare a plan will be readily available, since much of the technical information that is already required in Item #7 of the same list and section and in other sections of the code will form the basis for the creation of the plan.

Once a plan is developed, the designer or the supplier of the system can use it as the basis for future projects, therefore, the time required to prepare it for subsequent projects will decrease. Likewise, a plan developed for another facility with the same technology and a similar scope can inform the development of a plan for a new facility, also reducing the time required to develop the new plan.

The cost of inaction, when considering the risks to first responders and property losses, far outweighs the cost of pre-planning.

[1] https://home.akitabox.com/emergency-response-planning-checklist-pdf

Public Comment# 2385

F134-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

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

Reason: This proposed change is consistent with NFPA 855, Section 4.1.2.1.2 and recognizes that there are federally enforced NAERC restrictions that regulate distribution of certain sensitive electric utility plans and documents.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only addresses the manner in which documentation is provided to the code official.

F134-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1207.1.3.1 Utilities applicability. Plans and specifications associated with ESS owned and operated by electric utilities shall comply with section 4.1.2.1.2 of NFPA 855 ~~as a component of the electric grid that are considered critical infrastructure documents in accordance with the provisions of the North American Electric Reliability Corporation and other applicable governmental laws and regulations shall be made available to the fire code official for viewing based on the requirements of the applicable governmental laws and regulations.~~

Add new standard(s) as follows:
NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems

Committee Reason: This proposal both clarifies when the fire code official can review plans and specifications as permitted by applicable laws and regulations and coordinates with NFPA 855. The modification provide specific references to NFPA 855 to address duplicated language. (Vote 14-0)

F134-21

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: This public comment is focused upon making this proposal along with F132-21 consistent with the following proposals

1. F138-21
2. F140-21
3. F141-21
4. F143-21
5. F144-21
6. F145-21
7. F146-21
8. F151-21
9. F152-21

A direct reference to NFPA 855 was not provided in those proposals.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This does not change the outcome as the technical provisions will not change.

Public Comment# 2259

F138-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

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

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
National Electrical Safety Code(R) (NESC(R))

Reason: This proposed change is consistent with NFPA 855, Sections 8.1.1, 6.1.1.2, and 8.1.2 and allows options for lead acid and Ni-cad battery system ESS commissioning for telecommunications and electric utility installations.
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
It merely provides industry options for commissioning ESS.

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F138-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

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

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

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities and located outdoors or in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76 shall be permitted to have a commissioning plan in

compliance with recognized industry practices in lieu of complying with Section 1207.2.1.

2. Lead-acid and nickel-cadmium battery systems that are ~~designed in accordance with IEEE C2,~~ used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utilities, and located in building spaces or walk-in units used exclusively for such installations shall be permitted to have a commissioning plan in compliance with applicable governmental laws and regulations in lieu of developing a commissioning plan in accordance with Section 1207.2.1.

~~IEEEC2-2017 National Electrical Safety Code(R) (NESC(R))~~

Committee Reason: Provides the necessary exceptions to commissioning for lead-acid and nickel-cadmium battery systems in certain applications and provides consistency with NFPA 855. The modification removes an unnecessary standard reference to IEEE C2. (Vote: 12-2)

F138-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.2.1, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

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

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

1. Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities and located outdoors or in building spaces or walk-in

units used exclusively for such installations that are in compliance with NFPA 76 shall be permitted to have a commissioning plan in compliance with recognized industry practices in lieu of complying with Section 1207.2.1.

2. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2,used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utilities, and located in building spaces or walk-in units used exclusively for such installations shall be permitted to have a commissioning plan in compliance with applicable governmental laws and regulations in lieu of developing a commissioning plan in accordance with Section 1207.2.1.

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: This is the language that was vetted and approved by the FCAC.
IEEE C2 is a published and available standard. It will also be updated by next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY

https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It provides another option for the design and installation of such systems at utility facilities.

Public Comment# 2651

F140-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

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

Reason: This proposed change is consistent with NFPA 855, Sections 4.2.1.1 through 4.2.1.3 and allows certain battery systems in telecommunication, electric utility and UPS applications to not be listed to UL 9540.
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
It introduces applications in which certain ESS technologies are not required to be listed.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

F140-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

Exceptions:

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

~~**IEEEC2-2017 National Electrical Safety Code(R) (NESC(R))**~~

Committee Reason: The proposal was approved to be consistent with the previous action on F138-21. This includes both the need to address exceptions for certain battery technologies and also the removal of IEEE C2 as the modification addresses. There is concern that fire code officials should not have to familiar with IEEE C2. (Vote: 12-1)

F140-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.3.1, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

Exceptions:

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

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: This was the original language approved by the FCAC.
IEEE C2 is available for use. It will also be updated by next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This provides another option with no impact on construction costs.

Public Comment# 2653

F143-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

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

Reason: This proposed change is consistent with NFPA 855, Sections 4.6.6 and 4.6.7 and includes exceptions for certain battery technologies in electric utility and UPS applications .
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction. It introduces applications in which certain ESS technologies are not required to meet size and separation requirements.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

F143-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

Exceptions:

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are ~~designed in accordance with IEEE C2,~~ used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and limited to not more than 10% of the floor area on the floor on which the ESS is located.
4. The *fire code official* is authorized to approve larger capacities or smaller separation distances based on large-scale fire testing complying with Section 1207.1.5.

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

Committee Reason: The proposal was approved based upon the need for consistency with NFPA 855 and providing appropriate technology specific exceptions. The modifications clarify that the list is actually a list of exceptions and also to remove IEEE C2 consistent with modifications made to F138-21, F140-21 and F141-21. (Vote: 14-0)

F143-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.5.1, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

Exceptions:

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are designed in accordance with IEEE C2,used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and limited to not more than 10% of the floor area on the floor on which the ESS is located.
4. The *fire code official* is authorized to approve larger capacities or smaller separation distances based on large-scale fire testing complying with Section 1207.1.5.

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .

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

Commenter's Reason: This is the original proposal approved by FCAC.
IEEE C2 is available for use and will be updated by next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This provides another option for utility installations.

Public Comment# 2655

F144-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

Exceptions:

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

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

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

1778-2014 Uninterruptible Power Systems

Reason: This proposed change is consistent with NFPA 855, Section 4.3.9.3 and allows exceptions to elevation requirements for certain battery technologies in electric utility and UPS systems.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

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

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

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

Exceptions:

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Lead-acid and nickel cadmium systems that are ~~designed in accordance with IEEE C2,~~ used for dc power for control of substations and control and safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.
3. Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located.
4. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.
5. Where *approved* by the *fire code official,* installations shall be permitted on higher and lower floors.

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

Committee Reason: This proposal was approved based upon consistency with NFPA 855 and recognizing battery technology specific exceptions. The modification removes the reference to IEEE C2 consistent with the actions on F138-21, F140-21, F141-21 and F143-21. (Vote: 13-0)

F144-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.5.3, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

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

Exceptions:

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

applications, which is limited to not more than 10% of the floor area on the floor on which the ESS is located.

4. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.
5. Where *approved* by the *fire code official,* installations shall be permitted on higher and lower floors.

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: This was the language that was approved by the FCAC.
IEEE C2 is available for use, and it is being updated by next year to provide even more safety improvements.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This provides an exception for utility systems that comply with IEEE C2.

Public Comment# 2681

F145-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

1207.5.4 Fire detection. An *approved* automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas and walk-in units containing electrochemical ESS. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where *approved* to a constantly attended location.

Exception: Normally unoccupied, remote stand-alone telecommunications structures with a gross floor area of less than 1500 ft ^{2} (139 m^2) utilizing lead-acid or nickel cadmium batteries shall not be required to have a fire detection system installed.

1207.5.4.1 System status. Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2, used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in Section 1207.5.4.

~~Where required by the *fire code official*, visible annunciation shall be provided on cabinet exteriors or in other *approved* locations to indicate that potentially hazardous conditions associated with the ESS exist.~~

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoe Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

Reason: This proposed change is consistent with NFPA 855, Sections 4.10.2 and 4.10.3. It allows small remote telecommunication facilities, such as mountaintop repeaters, to not require a fire detection system. It also revises the fire detection system requirements for certain electric utility installations to use process control systems to monitor the smoke or fire detectors.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It is actually a relaxation of requirements.

Staff Analysis: A review of the standard proposed for inclusion in the code, IEEE C2-2017, National Electrical Safety Code(R) (NESC(R)), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

F145-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

1207.5.4.1 System status. Lead-acid and nickel-cadmium battery systems that are ~~designed in accordance with IEEE C2,~~ used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in Section 1207.5.4.

~~IEEEC2-2017National Electrical Safety Code(R) (NESC(R))~~

Committee Reason: This proposal was approved and modified based upon past actions on F138-21, F140-21, F141-21, F143-21 and F144-21. (Vote: 14-0)

F145-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.5.4.1, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

1207.5.4.1 System status . Lead-acid and nickel-cadmium battery systems that are designed in accordance with IEEE C2,used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in Section 1207.5.4.

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: The exception should apply to small and remote utility buildings as well as telecommunication buildings.
The language regarding IEEE C2 was in the original proposal that was vetted and approved by the FCAC.

IEEE C2 is available for use and will be updated next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This will decrease costs for small and remote utility facilities.

Public Comment# 2699

F146-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

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

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

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

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

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

~~**Exception**~~ **Exceptions:**

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoe Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code(R) (NESC(R))

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

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

Reason: This proposed change is consistent with NFPA 855, TIA Log #1486, and Sections 4.11.6 and 4.11.5. The new sprinkler density requirements were based, in part, on testing conducted by FM. The two exemptions for not requiring fire suppression for certain lead-acid and Ni-Cad battery systems used in electric utility and UPS applications were consistent with requirements in place prior to the 2018 IFC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as

well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
This proposal may result in an increase in the cost of construction. Large scale UL 9540A fire testing may dictate larger sprinkler densities be provided. However, the two exceptions have the potential to reduce the cost of construction.

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

F146-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

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

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

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

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

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

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

Exceptions:

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

Delete without substitution:
~~IEEEC2-2017 National Electrical Safety Code(R) (NESC(R))~~

Committee Reason: This proposal was approved and modified based upon past actions on F138-21, F140-21, F141-21, F143-21, F144-21 and F145-21. In addition, it provides the scoping of the criteria for automatic sprinkler protection and focuses on the specific room or area versus fire area. (Vote: 14-0)

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.5.5

Proponents: Andrew Bevis, representing National Fire Sprinkler Association requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

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

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

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

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

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

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

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

Exceptions:

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

Commenter's Reason: This pointer to NFPA 13 needs to be included into this proposal. This proposal leaves the user with the possibility to incorrectly interpret that remaining requirements of NPFA 13 would not apply and only the design densities are applicable. This mod was supported by the FCAC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is simply a pointer to the remaining NFPA 13 requirements that are already required by the standard.

Public Comment# 2380

Public Comment 2:

IFC: 1207.5.5, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

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

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

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

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

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

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

Exceptions:

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

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: This is the original language that was vetted and approved by the Fire Code Action Committee.
IEEE C2 is available for use, and will be updated again by next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This provides another option for utility systems and does not impact the overall costs.

Public Comment# 2696

F150-21

Proposed Change as Submitted

Proponents: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (ATIS) (richard.kluge@ericsson.com)

2021 International Fire Code

Revise as follows:

1207.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised ~~by an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or~~ and shall initiate an audible and visible signal at an *approved* constantly attended ~~on-site~~ location.

1207.6.1.2.4 Gas detection system. Where required by Section 1207.6.1.2, rooms, areas and walk-in units containing ESS shall be protected by an *approved* continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area or walk-in unit exceeds 25 percent of the LFL.
2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.
3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5.
4. Failure of the gas detection system shall ~~annunciate a trouble signal at an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or shall~~ initiate an audible and visible trouble signal at an *approved* constantly attended ~~on-site~~ location.

Reason: The requirements to "supervise mechanical exhaust ventilation and gas detection system operation at an approved central station, proprietary or remote station service in accordance with NFPA 72" is incongruent with other parts of the code and is not warranted by the safety record of traditional battery systems to which these code sections apply.

Compare these supervision requirements to those of *IFC Chapter 6: Building Services and Systems, Section 608 Mechanical Refrigeration, subsection 608.18.1 Ventilation system activation* which requires:

1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system in Section 608.18.2.
3. The detection, signaling and control circuits shall be supervised.

While items 1 and 2 are consistent with the section on battery system ventilation and gas detection, item 3 is much more flexible as there is no requirement that operations be supervised by an approved central station, proprietary or remote station service.

Furthermore, *IFC Chapter 6004: Highly Toxic and Toxic Compressed Gases, Section 6004.2.2.10.1 Gas detection system alarms* specifies:

> The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both audible and visible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

Once again, it is required the alarm be transmitted to a constantly attended location, but it is left to the user to decide if central station, proprietary or remote station service is warranted.

Meanwhile, *IFC Chapter 9: Fire Protection and Life Safety Systems* comes close to discouraging the use of fire alarm systems to monitor gas sensors and detectors. *Section 916 Gas Detection Systems, subsection 916.10 Fire alarm system connections* states:

> Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved and connected in accordance with the fire alarm equipment manufacturer's instructions.

Section 1207.6.1.2 on ventilation of batteries used for energy storage is the only location in the code that dictates monitoring of mechanical ventilation and gas detection systems via central station, proprietary or remote station service. While the option for monitoring at a constantly attended on-site location is available in the current text, installations of many telecommunications network batteries are at normally unattended locations, so this option is not available.

A better approach is to permit a failure of the ventilation or gas detection system to initiate an audible and visible signal at any approved constantly attended location as proposed by the code change submittal. This would, as an example, allow for alarms from telecommunications facilities to be monitored and detected at a Network Operations Center or other proprietary alarm center, consistent with how similar alarms for refrigerant gases and toxic gases are treated in the code.

Also note that in the 100-year experience with the use of batteries as standby power within the telecommunications industry there is no history of explosions resulting from gas evolution within buildings as a result of failed ventilation or monitoring. Even on large battery plants, the generation rate

of hydrogen gas is maintained well below the LFL by normal room ventilation specified for human occupancy. It is neither consistent with the code treatment of these types of systems nor justified by the scant loss record to mandate monitoring of these systems by any third-party.

Cost Impact: The code change proposal will decrease the cost of construction
Allowing for other alternatives for monitoring of mechanical ventilation and gas detection system operation will reduce the cost of code compliance.

F150-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal is based upon a misunderstanding of the application of NFPA 72. Proprietary monitoring is allowed which would permit either onsite or off site supervision by the utilities or telecommunication companies. It was suggested that perhaps the reference to on-site location should be deleted based upon the confusion it adds with those terms. (Vote: 14-0)

F150-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.6.1.2.3, 1207.6.1.2.4

Proponents: Richard Kluge, representing Alliance for Telecommunications Industry Solutions (ATIS) (richard.kluge@ericsson.com) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

1207.6.1.2.3 Supervision . Required mechanical exhaust ventilation systems shall be supervised by an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible signal at an *approved* constantly attended ~~on-site~~ location.

1207.6.1.2.4 Gas detection system . Where required by Section 1207.6.1.2, rooms, areas and walk-in units containing ESS shall be protected by an *approved* continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area or walk-in unit exceeds 25 percent of the LFL.
2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.
3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.5.
4. Failure of the gas detection system shall annunciate a trouble signal at an *approved* central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible trouble signal at an *approved* constantly attended ~~on-site~~ location.

Commenter's Reason: It was suggested during discussion among the IFC Committee in CAH that the "on-site" limitation be removed as it adds confusion, potentially conflicting with the earlier designation that the alarm be monitored by an approved central station, proprietary or remote station service in accordance with NFPA 72.

There is no need for the ventilation or gas detection alarm to be monitored on-site. It may be safer to monitor off-site. The revised wording is more consistent with how similar alarms for refrigerant gases and toxic gases are currently treated in the IFC and is identical to the requirements of NFPA 855, Standard for the Installation of Stationary Energy Storage Systems. The AHJ should be able to approve any constantly attended monitoring location for these types of alarm, either on-site or off-site.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No cost impact, only more options for the AHJ to approve monitoring.

Public Comment# 2776

F151-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

Exceptions:

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

Add new standard(s) as follows:

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoe Lane
Piscataway, NJ 08854
USA

IEEE Institute of Electrical and Electronics Engineers.
C2-2017 National Electrical Safety Code

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook, IL 60062

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

Reason: This proposal accomplishes the following:
1. ESS Cabinets - Several large ESS cabinets containing lithium ion batteries are now being manufactured. This corrects an oversight for these units not requiring explosion control. In lieu of providing explosion control in accordance with Section 911 (e.g. NFPA 68 or 69) these ESS cabinets can be designed so that “no debris, shrapnel, or enclosure pieces are ejected” during large scale fire testing complying, which is terminology used in the unit level test acceptance criteria in UL 9540A. See item (3)

2. The reference to UL 9540A is being removed from exception 1 since it is covered by the reference to 1207.5.1.

3. Allows exemptions (4), (5), and (6) for lead-acid and Ni-Cad ESS at telecom, electric utility and UPS installations that are consistent with NFPA 855.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal has the potential to increase the cost of construction It requires explosion control in ESS cabinets which was overlooked during the last code cycle. It can decrease the cost of construction for installations covered by (4), (5) and (6).

Staff Analysis: A review of the following standards proposed for inclusion in the code, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

- IEEE C2-2017, National Electrical Safety Code(R) (NESC(R))
- UL 1778-2014 - Uninterruptible Power Systems with revisions through October 2017

F151-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

Exceptions:

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

~~IEEEC2-2017 National Electrical Safety Code~~

Committee Reason: This proposal was approved and modified based upon past actions on F138-21, F140-21, F141-21, F143-21, F144-21, F145-21 and F146-21. (Vote: 14-0)

F151-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.6.3, IEEE (New)

Proponents: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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

Exceptions:

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

IEEE

Institute of Electrical and Electronics Engineers Standards Association
445 Hoes Lane
Piscataway , NJ 08854

IEEE Institute of Electrical and Electronics Engineers .
National Electrical Safety Code(R) (NESC(R))

Commenter's Reason: This was the original proposal vetted and approved by the FCAC.
IEEE C2 is available for use and will be updated next year.

Bibliography: IEEE C2-2017 - *2017 National Electrical Safety Code(R) (NESC(R))*, 2016, Institute of Electrical and Electronics Engineers, New York, NY
https://ieeexplore.ieee.org/document/7526279

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This will provide another option for utility applications.

Public Comment# 2743

F153-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

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

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

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

Exceptions:

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

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

~~**Exceptions:**~~

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

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

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

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

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

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

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

1. 40 kWh within utility closets, basements, and storage or utility spaces.
2. 80 kWh in attached or detached garages and detached accessory structures.
3. 80 kWh on exterior walls.
4. 80 kWh outdoors on the ground.

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

1207.11.5 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL

1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters *listed* for utility interaction.

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

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

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

Delete without substitution:

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

Revise as follows:

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

Reason: Significant changes were made when the ESS requirements were updated in the 2021 International Residential Code. Those changes are also being introduced into the next edition of the NFPA 855 Stationary Energy Storage system standard. This update includes requirements that are essentially identical to the 2021 IRC, with the following two exceptions.

1. In section 1207.11.1 an exception was removed that allowed, where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways. This type of installation is not common, and there are concerns with the overall safety of these unlisted systems. This was also not allowed in NFPA 855.
2. There has been considerable discussion about whether ESS should be allowed in certain rooms and spaces within the dwelling unit. Item 4 to Section 1207.11.3 provides more requirements for protection of walls and ceilings where located in utility closets, basements and storage or utility spaces.

The footnote to 1207.1 was revised to clarify that ESS in Group R-3 and R-4 occupancies only have to comply with section 1207.11, except when larger systems that exceed the energy capacity limits of Section 1207.11.4. Those larger system must comply with the requirements that apply to commercial ESS installations, which is also in the 2021 IRC.

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

Cost Impact: The code change proposal will increase the cost of construction
This proposal has the potential to increase the cost of construction due to the eliminations of exceptions and possible limitations on locations of ESS.

F153-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved as it aligns with the IRC provisions. There was some concern on Item 4 of Section 1207.11.3 regarding the need for approval from the Fire Code Official. However that was not seen as necessary by the committee and had been heavily discussed with a collaborative effort between enforcement officials and industry. (Vote: 13-0)

F153-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.11.3

Proponents: Joshua Costello, representing County of Los Angeles Fire Department (joshua.costello@fire.lacounty.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

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

1. Detached garages and detached accessory structures.
2. Attached garages separated from the *dwelling unit* living space and *sleeping units* in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors or on the exterior side of exterior walls located a minimum of 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed Utility closets, basements, storage or utility spaces within *dwelling units* and *sleeping units* with finished or noncombustible walls and ceilings where the UL 9540A test data establishes that the concentration of flammable gas does not exceed 25% LFL in air for the applicable compartment installation size. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8 in. Type X gypsum wallboard.

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

Commenter's Reason: The **language being added by this public comment** (which is only to Section 1207.11.3 of F153-21) **is to alert the code official of what is already required to be reviewed for the locations in option #4**.
It is extremely misleading to the code official **to omit the condition that the code official must first investigate/confirm that the UL 9540A test data (for the *specific* ESS model being considered for *indoor residential* installation)** establishes that the concentration of flammable gas does not exceed 25% LFL in air for the applicable compartment installation size.

Without doing so sets the occupants and first responders up for explosion and asphyxiation hazards. **Not all ESS are created equally, even listed ESS**. These performance criteria (see excerpts from **UL 9540, UL 9540A, and NFPA**, below) are in place for a reason, but if those responsible for enforcing them are misled into ignoring them, then they serve no purpose. **In our review of manufacturers' installation manuals and other materials readily available for indoor residential ESS, we find no mention of minimum installation compartment size data, despite the fact that UL 9540/UL 9540A requires it as a condition of installation/approval**. Each specific ESS model needs to be considered separately based upon its individual test data on the gas it produces during the performance tests that the IFC currently requires.

An ESS that is capable of significant thermal runaway (as shown by the gas-generation data of its UL 9540A tests) should not be allowed to be bolted within a residential dwelling/sleeping unit, for the following reasons:

• It is **well documented that ESS chemistries (which vary from manufacturer to manufacturer) have the potential for thermal runaway, which is largely the very reason for the code-referenced performance standards.** Causes of thermal runaway can include internal fault (such as from poor quality control during manufacture, overcharging, over-discharging, battery management software/firmware error, or simply **degradation due to age**) or damage from an external impact, exposure to fire, etc. Land, air, and marine transport of lithium-ion batteries of all types are extremely regulated and restricted for these very reasons, even for brand-new batteries (see references below).

• **Residential ESS will age, will not always be maintained,** contain an exponentially larger amount of potential energy than batteries we carry on ourselves, and **are bolted within a structure, and in the case of location option #4, immediately adjacent to sleeping rooms/areas**. This is not only an explosion and asphyxiation hazard, as presented above, but **also a problem for fire fighters attempting to control any incident involving thermal runaway of an ESS**:

- **The chemical reaction of lithium-ion thermal runaway within a cell or cells cannot be stopped, only slowed, such as by cooling.** The reaction continues until all fuel (lithium salts in this case) is consumed, even if it was temporarily slowed below the level of detection.
- **The cells are not accessible to fire fighters who are trying to cool them:**
  - The involved cells are located behind the outer skin of the ESS unit
  - In this case, the ESS units are bolted within an enclosed space in the interior of a residential dwelling.
  - **Hose stream application will be greatly encumbered** by the above, causing the need for **greater amounts of water** to be poured into the structure, and over **an extended period of time causing more and more damage** to the structure.
  - **Fire fighters are not equipped with the ability to remove an involved ESS from a structure:** it is an electrocution hazard as it stores electricity, and even more so because it is damaged. Disconnecting wires to/from the ESS changes neither the thermal runaway

chemical reaction that has already begun, nor the electricity it already stores. **The electrocution hazard of a damaged ESS remains even after the damaged cells have finished their thermal runaway.** How does a fire department ensure that it is safe to relinquish control of an R-3 or R-4 structure back to the responsible party, or walk away at all, when a residence contains a damaged ESS that had shown signs of thermal runaway? **Cooling measures will temporarily slow the thermal runaway process to below the level of detection. Reignitions** have been documented of lithium-ion batteries, even in cars, **weeks later. Definitive action requires sustained submersion within a water bath**, preferably salt water.

We plan to submit a code change proposal in the Group B session in order to accomplish a **correlating change to the IRC**.

• UL and NFPA standards provide the basis for this public comment:

A) **Excerpts from UL 9540 (2020 Edition) – Energy Storage Systems and Equipment:**

***Accessed from: https://www.shopulstandards.com/ProductDetail.aspx?productId=UL9540**

23.2 Large scale fire testing23.2.1 **Electrochemical type ESS, including but not limited to capacitor and battery ESS, shall be subjected to large scale fire testing in accordance with UL 9540A as follows in (a) – (g).** See Appendix E for guidance on code limits related to separation distances and energy capacity.

a) Systems with increased energy capacities as required in codes and standards;

b) Indoor systems with decreased separation distances to adjacent ESS units, doors and windows, or to combustibles, non-combustibles, or limited combustibles. This includes building construction components (e.g. wall and ceilings) or any materials in the vicinity of the ESS. See 42.2;

c) Outdoor systems with decreased separation distances to adjacent units and to exposures. See 42.4;

d) Outdoor wall mounted systems with reduced separation distances;

e) Indoor wall mounted systems;

f) **Systems for installation in residential dwellings (where permitted)**; and

g) When an explosion analysis is required to confirm the installations location is safe.

B) **Excerpts from UL 9540A *(2019 Edition) - ANSI/CAN/UL Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems:**
***Accessed from: https://www.shopulstandards.com/ProductDetail.aspx?productId=UL9540A**

4 Glossary

. . .

4.17 THERMAL RUNAWAY – The incident when an electrochemical cell increases its temperature through self-heating in an uncontrollable fashion. The thermal runaway progresses when the cell's generation of heat is at a higher rate than the heat it can dissipate. This may lead to fire, explosion and gas evolution.

. . .

1 Scope

1.1 The test methodology in this standard **determines the capability of a battery to undergo thermal runaway and then evaluates the fire and explosion hazard characteristics of those battery energy storage systems that have demonstrated a capability to undergo thermal runaway.**

1.2 The data generated will be used **to determine the fire and explosion protection required for an installation of a battery energy storage system** intended for installation, operation and maintenance in accordance with ICC IFC, NFPA 1, NFPA 70, IEEE C2, CAN/CSA C22.2 No. 0, and other codes affecting energy storage systems, and the manufacturer's installation instructions.

. . .

9 Unit Level

. . .

9.2 Test method – Indoor floor mounted BESS units

. . .

9.2.27 For residential use systems, **the gas collection data gathered in 9.2 shall be compared to the smallest room installation specified by the manufacturer to determine if the flammable gas collected exceeds 25% LFL in air.**

. . .

9.4 Test Method – Indoor wall mounted units

. . .

9.4.6 The gas collection methods shall be in accordance with Section 9.2. For residential use systems, **the gas collection data gathered in 9.2 shall be compared to the smallest room installation specified by the manufacturer to determine if the flammable gas collected exceeds 25% LFL in air.**

. . .

Table 9.1 - Unit Level Performance Criteria

[Excerpt of **residential indoor requirements** pertaining to **concentrations of flammable gas relative to the "smallest intended room installation size"**]

Table 9.1

Unit Level Performance Criteria

Installation **Performance Criteria** **Non-Residential Installations**. . .. . .**Residential Installations** Indoor Floor Mounted. . .
e) The concentration of flammable gas does not exceed 25% LFL in air for the smallest specified room installation size.

. . .

Indoor Wall Mounted

. . .

e) The concentration of flammable gas does not exceed 25% LFL in air for the smallest specified room installation size.

. . .

C) **NFPA 855 (1st Draft Report Revision to the 2020 Edition; creates the 2023 Edition.) – Standard for the Installation of Energy Storage Systems:**

Chapter 15 One- and Two-Family Dwellings and Townhouse Units

15.1* General.

ESS installations with a rating of 1 kWh (3.6 MJ) or greater and associated with one- or two-family dwellings or townhouse units shall comply with the requirements of this chapter.

15.2 Equipment Listings.

15.2.1

ESS ~~1 kWh or greater in maximum stored energy~~ shall be listed and labeled in accordance with UL 9540.

. . .

15.~~6~~ 4 ~~Location~~ Locations.

15.~~6~~ 4.1

ESS shall only be installed in the following locations:

(1) In attached garages separated from the dwelling unit living area and sleeping units in accordance with the local building code

(2) In detached garages and detached accessory structures

(3) Outdoors on exterior walls or on the ground located a minimum of 3 ft (914 mm) from doors and windows directly entering the dwelling unit

(4) In enclosed utility closets and storage or utility spaces where approved by the AHJ

~~15.6.1.1~~15.4.2

If the room or space where the ESS is to be installed is not finished, the walls and ceiling of the room or space shall be protected with not less than $^{5}/_{8}$ in. Type X gypsum board.

~~15.6.2~~15.4.3

ESS shall not be installed in ~~living area of dwelling units~~ sleeping rooms, or in ~~sleeping units other than within utility~~ closets ~~and storage~~ or ~~utility~~ spaces opening directly into sleeping rooms.

Bibliography: Industries and standards (largely based upon 49 CFR 175.10(a)(18), for those involving transportation) recognize the risks that remain inherent in these technologies and heavily restrict their transportation.:

A) **Transportation:**

1) **Airlines:**

(a) https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf

(b) https://www.skybrary.aero/index.php/Lithium-Ion_Aircraft_Batteries_as_a_Smoke/Fire_Risk

(c) https://www.faa.gov/hazmat/packsafe/more_info/?hazmat=7

(d) https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=23054

(e) https://www.tsa.gov/travel/security-screening/whatcanibring/items/lithium-batteries-more-100-watt-hours

(f) https://www.alaskaair.com/content/travel-info/baggage/prohibited-items/spare-batteries-electronic-devices

(g) https://www.cnbc.com/2019/02/27/us-bars-lithium-batteries-as-cargo-on-passenger-aircraft.html

2) **Shipping/Freight:**

(a) The International Air Transport Association (IATA) 2021 Lithium Battery Guidance Document – Transport of Lithium Metal and Lithium Ion Batteries Revised for the 2021 Regulations (https://www.iata.org/contentassets/05e6d8742b0047259bf3a700bc9d42b9/lithium-battery-guidance-document-2021.pdf)

(b) https://www.maritime-executive.com/article/fire-aboard-cosco-boxship-caused-by-container-load-of-batteries

(c) https://www.maritimeprofessional.com/news/lithium-battery-fires-threat-container-360275

(d) https://www.ups.com/assets/resources/media/en_US/pack_ship_batteries.pdf

(i) “Other types of batteries, including lithium ion and lithium metal types, may be fully regulated as hazardous materials (also known as dangerous goods) for transportation, so that in addition to those basic safety precautions they require use of specialized packaging, specific hazard labeling, and specific documents certifying compliance with the applicable regulations.”

(ii) “Research has demonstrated that for lithium ion batteries, reduced SoC may provide an additional level of safety during transport and reduce

the likelihood of a thermal event. In accordance with IATA, all lithium ion batteries (without equipment) shipped by air must not exceed 30% SoC."

B) **Other:**

1) https://ulfirefightersafety.org/posts/four-firefighters-injured-in-lithium-ion-battery-energy-storage-system-explosion.html

2) https://www.aps.com/en/About/Our-Company/Newsroom/Articles/Equipment-failure-at-McMicken-Battery-Facility

3) https://docket.images.azcc.gov/E000007939.pdf

4) Pacific Northwest National Laboratory: https://www.pnnl.gov/news-media/pnnl-invention-reduces-risk-battery-explosions

5) https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2020/January-February-2020/Features/EV-Stranded-Energy

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The change by this public comment will not increase the cost of construction because it is merely alerting the code official of something that is already required: a condition on the approval of installation that is already required by what is already a referenced standard.

Public Comment# 2440

F154-21

Proposed Change as Submitted

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., 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 Fire Code

Revise as follows:

1207.11.6 Fire detection. ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within *dwellings units*, *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 ~~907.2.10~~.
2. A listed heat alarm ~~heat detector listed and interconnected to the smoke alarms~~ shall be installed in locations ~~within *dwelling units*, *sleeping units* and attached garages~~ where smoke alarms cannot be installed based on their listing.

Reason: The purpose of this proposal is to:

1. Divide the single paragraph into distinct parts for clarity, separating the charging language from the provisions to provide single-station or multi-station smoke alarms per the code.
2. Correct the section pointer to section 907.2.10 to the revised location in the 2021 IFC, 907.2.11.
3. Clarify the intent is to provide both heat detection and alarm annunciation in the ESS location through the use of listed heat alarms.

The term heat detector was replaced because the heat detectors do not include a local annunciator. A heat detector is only required to detect a heat event, and safety officials want an audible alarm.

The term interconnected is removed from this section as the requirements for interconnection are provided in section 907.2.11 of the code.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies existing code language.

Staff Analysis: Note that the reference to Section 907.2.10 has been corrected by errata to Section 907.2.11 for the first printing of the 2021 IFC.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved based upon the revision from "detector" to "alarm" which is more technically correct. The proponent is encouraged to address the issue of interconnection during public comment. (Vote: 11-3)

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.11.6

Proponents: Brad Fox, representing Santa Clara County Fire Department (brad.fox@sccfd.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1207.11.6 Fire detection . ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within *dwellings units*, *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 .
2. A listed heat alarm or heat detector with annunciation shall be installed ~~in locations~~ and interconnected to dwelling unit smoke alarms where smoke alarms cannot be installed based on their listing.

Commenter's Reason: Heat alarms cannot be used in all applications. Current available heat alarms are ordinary temperature which activate at 135F, but their UL listing only allows ambient temperatures up to 100F or 115F. In many parts of the country unconditioned garage temperatures easily exceed these ratings during warmer months. Intermediate temperature heat detectors can be successfully installed with 120V power, interconnected to home smoke alarms, and provided with a local annunciator through a relay. I recommend giving manufacturers and installers more options, and ensuring an appropriately listed device is available for all installations.
The original reason provided to remove the term interconnected was a reference to interconnection provisions of 907.2.11. However 907.2.11 only references smoke alarms, and does not state interconnection requirements for a heat alarm/detector to smoke alarms. It will not be obvious to code users to make the connection between 1207.11.6 and smoke alarm requirements of 907.2.11. Stating the interconnection requirement to dwelling unit smoke alarms provides clarity of intent to code users.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment clarifies existing code language.

Public Comment# 2798

Public Comment 2:

IFC: 1207.11.6

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

1207.11.6 Fire detection . ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within *dwellings units*, *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 .
2. A listed heat alarm shall be installed in locations where smoke alarms cannot be installed based on their listing. Heat alarms shall be interconnected to the smoke alarms in the structure.

Commenter's Reason: This Public Comment is designed to retain the language requiring interconnection of the heat alarms to the smoke alarms. This original proposal deleted this requirement with the reasoning that it was duplicative language since interconnection is already required in Section 907.2.11. However, Section 907.2.11 does not require heat alarms to be interconnected. Section 907.2.11.5 requires interconnection, but does apply to heat alarms; it is limited to smoke alarms. In fact, heat alarms are not even included in Section 907.2.11. Therefore, the basis for removing this requirement is not found in the code.

This Public Comment replaces the requirement for interconnection and ensures that interconnection of heat alarms to smoke alarms currently in the 2021 IFC is retained.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This Public Comment does not impact the cost of construction, because the requirement is already in the 2021 IFC.

Public Comment# 2534

F155-21

Proposed Change as Submitted

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., 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 Fire Code

Revise as follows:

1207.11.7 Protection from impact. ~~Stationary storage battery systems~~ ESS installed in a location subject to vehicle damage in accordance with ~~shall~~ Section 1207.11.7.1 or 1207.11.7.2 shall be provided with impact protection in accordance with Section 1207.11.7.3. ~~be protected by *approved* barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code*.~~

Add new text as follows:

1207.11.7.1 Garages.
Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section 1207.11.3 shall be installed. The normal driving path is a line perpendicular to the garage vehicle opening to the back wall, extending 3 ft. (914 mm) to either side along the back wall and to a height of 48 in. (1219 mm), (See Figure 1207.11.7.1)

Exception: Where the clear height of the vehicle garage opening is 7 ft 6 in, (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

1207.11.7.2 Other locations subject to vehicle impact.
Where an ESS is installed in a location other than as defined in Section 1207.11.7.1, and is subject to vehicle damage, impact protection shall be provided in accordance with Section 1207.11.7.3.

1207.11.7.3 Impact Protection Options.
Where ESS is required to be protected from impact in accordance with Section 1207.11.7.1 or 1207.11.7.2 such protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:
   1.1 48 inches (1219 mm) in length by 3 inches (76mm) in diameter schedule. 80 steel pipe embedded in a concrete pier 12 inches (304 mm) deep and 6 inches (152 mm) in diameter, with 36 inches (914 mm) of pipe exposed, filled with concrete, and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.
   1.2 36 inches (914 mm) in height by 3 inches (76 mm) in diameter schedule 80 steel pipe fully welded to an 8 inches (203 mm) by 8 inches (203 mm) by ¼ inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of 4 - ½ inch (13 mm) concrete anchors with 3 inch (76 mm) minimum embedment. Spacing shall be not greater than 60 inches. (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.
   1.3 Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than a 60 inches. (1524 mm). Located not less than 6 inches (152mm) from the ESS.
2. Wheel barriers constructed in accordance with one of the following:
   2.1. 6 inches (152 mm) in height by 6 inches (152 mm) in width wheel barrier made of concrete or polymer, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS.. Minimum 2 - ½ inch (13 mm) diameter concrete anchors with 3 inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be no greater than 36 inches. (914 mm).
   2.2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturers installation instructions.
3. Approved method designed to resist a 2000 lbf (8899 Newtons) impact in the direction of travel at 24 inches (608 mm) above grade.

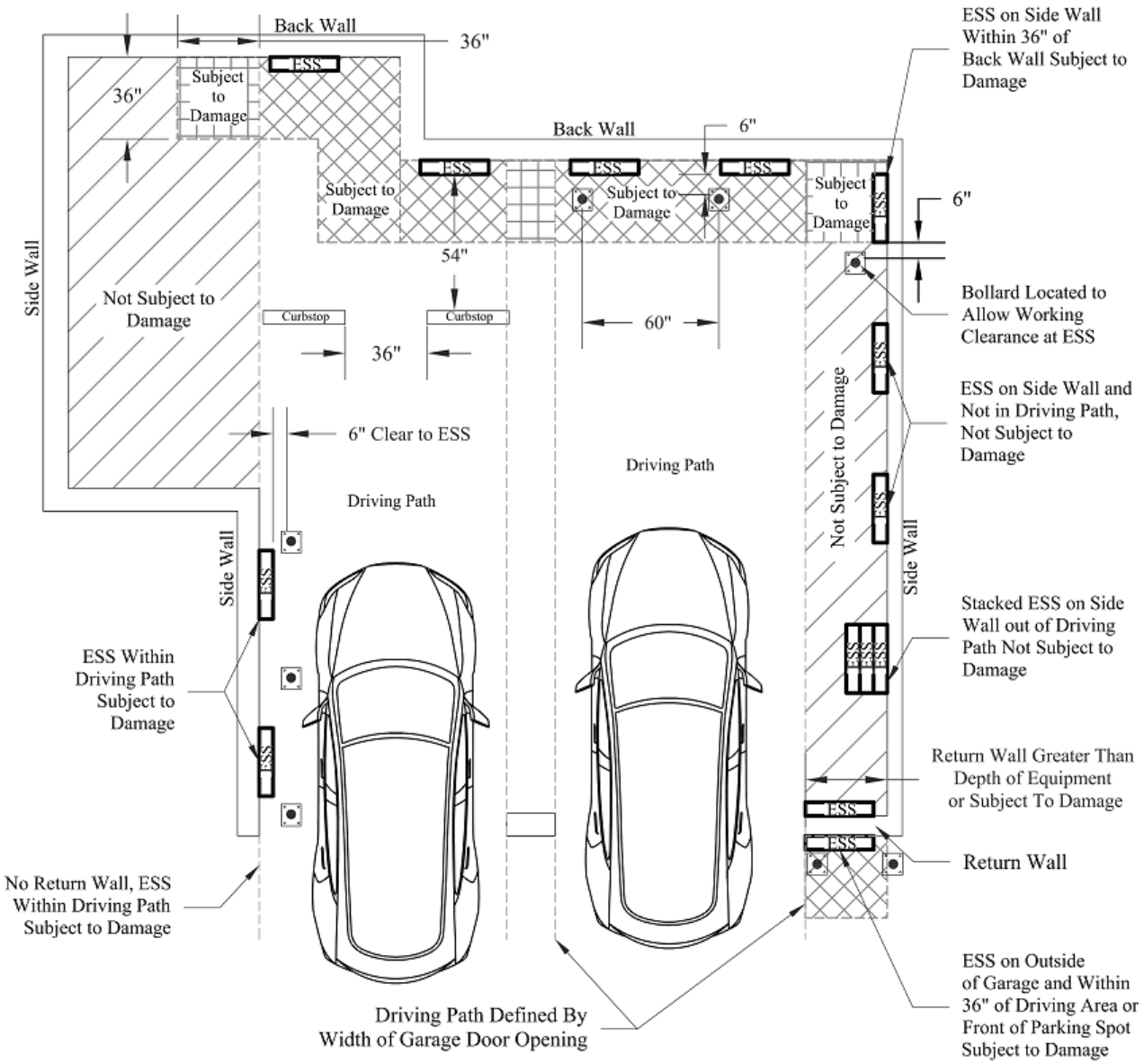


FIGURE 1207.11.7.1 ESS VEHICLE IMPACT PROTECTION

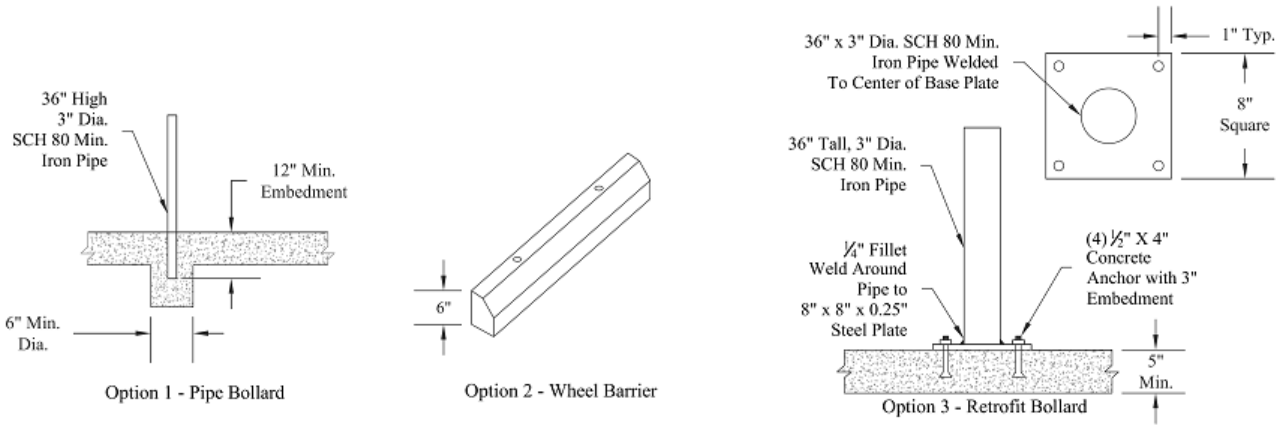


FIGURE 1207.11.7.3 IMPACT PROTECTION OPTIONS

Reason: Summary

First, a minor editorial change is needed to replace stationary storage battery system with ESS . This should have been part of a global change last cycle.

Second, the last sentence referring to appliances has been removed. Section 304.3 is related to the elevation of ignition sources not vehicle impact protection. The concern about raising ignition sources has historically been applied to fuel-fired appliances such as water heaters. These types of appliances are the only equipment able to be listed as flammable vapor ignition resistant. Even when a water heater has not been evaluated to ANSI Z21.10, only the actual ignition source needs to be elevated above 18", not the entire water heater. It's important to note that NFPA 70 does not consider the area below 18" a classified location in above-grade residential garages.

The third and most substantial change addresses the need for a clearly defined area in which a residential garage ESS installation would trigger the "Subject to Vehicle Damage" requirement found in 1207.11.7. The existing language has led to widely varying interpretations and enforcement of impact protection.

- New language (1207.11.1) has been added to define this area and set the expectation that the barriers are intended to deflect, resist, or visually deter an impact. This language mirrors the existing Section 312.3 in the IFC.
- A minimum installation height of 48" within the likely impact area has been added to allow elevation of the ESS as a permissible mitigation option. An exception to this 48" minimum has been included to recognize that a reduced garage opening height would thereby limit vehicle height and allow a lower placement of equipment before additional protection is needed. This exception is inspired by existing IMC Commentary:

"The height of the vehicle entry opening of the garage or carport can be used as a guide in determining how tall of a vehicle could be driven into the garage or carport"

- A new Figure 1207.11.7.1 has been added to illustrate the zones in which a typical residential garage ESS installation would trigger the need for impact protection. This figure is based on existing IMC commentary related to the installation of fuel-fired appliances that may pose a fire hazard when damaged. The IMC commentary Figure 304.6 (2) has been modified to reflect common ESS installation locations and takes a similar approach to mitigating the risk of impact.
- New language (1207.11.7.2) has been added to address other than garage locations that may also have vehicle access such as residential driveways, and also allows some flexibility to the AHJ and installer for larger, non-typical, or custom residential garages where the normal path of vehicle travel falls outside of the area defined in 1207.11.7.1.

Finally, the prescriptive barrier and post designs per IBC 1607.10 or IFC 312.2 may be appropriate for an energy storage system in a public access parking lot, garage, or other throughway. We are therefore not proposing any changes to 1207.4.5. However, the forces assumed in these sections are not representative of the impact scenarios expected in a private residential garage reserved for permanent occupants.
For example, the calculation in IBC 1607.8.3 results in approx. 12K lb-force applied to the anchorage, which causes readily available bollard to concrete connections to fail. This effectively eliminates the possibility of retrofitting a floor mounted bollard as a solution. Additionally, the posts described in IFC 312.2 can not be reasonably installed in an existing residential garage, and although uncommon especially those with tensioned concrete slabs. This leaves AHJs and installers with no guidelines for a retrofit bollard designed to deter vehicle operators from carelessly striking the ESS units. While IFC Section 312.3 does allow an alternative approach, designers, installers, and code officials will benefit from more explicit guidance within Section 1207.11. In new construction posts designed in accordance with Section 312 may be feasible, however it is unlikely that a homebuilder would be able to anticipate the installation of an ESS in a specific location in a garage. The proposed options for impact protection were inspired by existing IMC commentary figure 304.6(2). These options have been modified to provide a consistent amount of force resistance across the available choices, something teh IMC commentary does not do. These options more reasonably reflect the expected impact scenario described in the commentary text:

“The barriers shown in the commentary figure will not eliminate all possibility of a motor vehicle contacting the appliances but will offer a reasonable warning to a driver who is slowly navigating near the appliances”

And:

“Although this section does not specifically require the impact protection provided to stop any type of vehicle at any speed, the intent is for the impact protection to cause the driver to want to stop vehicle movement out of concern for damage that could be occurring. The choice of the type, structural capacity and the location of barriers is the responsibility of the designer.”

Between limiting the locations that ESS Batteries can be installed, and defining the requirements when impact protection is required, the result will be an improved level of protection from the risk of vehicle impacts, and damage mitigation if incidents do occur.

Technical Justification

An engineering review of the impact protection guidance found across the I-Codes and ASCE 7-16 was completed. Specifically Section 312 of both the prior and existing IFC, Section 4.5.3 of ASCE 7-16, and commentary language and figures associated with Section 304.6 of the IMC.

It is important to recognize that the prescription of the IFC Section 312 for bollards in public driving areas does not lead to a bollard that will resist 12k lbs. as prior editions of the code suggested.. In actual testing ((Harrison (SwRI), Evaluation of collision protection provided by vehicle impact bollards and propane cylinder exchange cabinets 2013)) the static resistance was between 900 lbs. at 36” (2.7k lbs. reaction) and 11k lbs. at 36” (33k lbs. reaction).

ASCE 7-16 specifies vehicle barrier systems must resist 6k lbs. load at between 18” and 27” (9k to 13.5k lbs. reaction) There are no commonly available retrofittable bollards that can do this in an average residential garage without adding thickness to the concrete.

The IMC commentary figure when back calculated sets a bar of physical resistance which seems more appropriate to this risk and allows for solutions that are more practical to apply. For example, the bollard shown in IMC commentary Figure 304.6(2) will take an impact of about 625 lbs. load applied at 24", resulting in a 1250 lb reaction force at the post to base plate connection. Likely outcomes based on this force include:

- No damage at 0.5 mph impact from an average passenger car.
- Bollard would deflect permanently a few inches at a 2 mph collision speed
- Anchor bolts would shear off or blowout at a 5 mph collision speed.

The limitation is mostly the concrete to base plate connection. The IRC requires a 2500-3000 psi mix for garages, and garages are often of stronger mix, especially in freeze prone areas. The average garage concrete slab will fall within these specifications: 2500 - 4000 psi concrete with 5" min thickness. Using 1/2" epoxy anchors this equates to roughly a 2mph impact that could be sustained without significant damage to the bollard. This is aligned with a standard Uline 4.5" bollard with 1/8" wall thickness and a 8x8x3/8" base plate. More strength requires a larger base plate, as the limitation is the connection to the concrete.

The bolt down bollard specified in this proposal will take a 2000 lb impact, 24" off the ground with no damage, given 3000 psi concrete. More than 6" of permanent deflection would require a very significant force, and then only touching the face of the ESS. This seems a reasonable level of protection, and clearance distance.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Bibliography:
Harrison, O. (2013). Evaluation of Collision Protection provided by vehicle impact bollards and propane cylinder exchange cabinets (Rep. No. 18.19083.01.107.FR1). Southwest Research Institute.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies and gives more technical rigor to the requirements.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal provides much needed options for impact protection. There was some concern that the solutions provided are still too costly. (Vote: 12-2)

F155-21

Individual Consideration Agenda

Public Comment 1:

IFC: 1207.11.7.1, FIGURE 1207.11.7.1, 1207.11.7.3, FIGURE 1207.11.7.3

Proponents: Larry Sherwood, representing Interstate Renewable Energy Council (larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov) requests As Modified by Public Comment

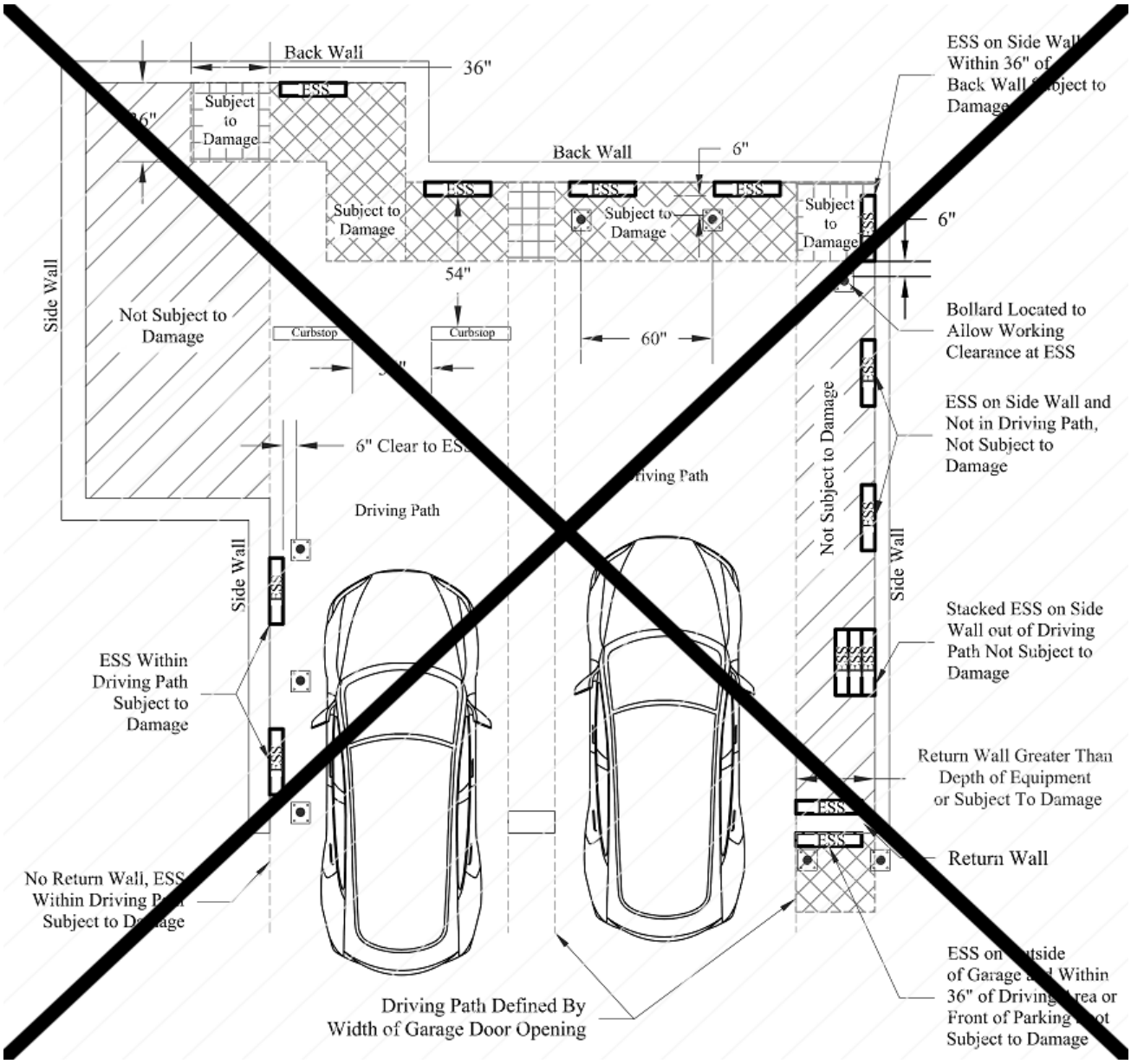
Modify as follows:

2021 International Fire Code

1207.11.7.1 Garages . Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section 1207.11.3 shall be provided ~~installed~~. The normal driving path is a space ~~line perpendicular to~~ between the garage vehicle opening ~~to~~ and the interior face of the back wall~~, extending 3 ft. (914 mm) to either side along the back wall and~~ to a height of 48 in. (1219 mm) above the finished floor. The width of the normal driving path shall be equal to the width of the garage door opening. Impact protection shall also be provided for an ESS installed at either of the following locations (See Figure 1207.11.7.1):

1. On the interior face of the back wall and located within 36" to the left or to the right of the normal driving path.
2. On the interior face of a side wall and located within 24 inches from the back wall and 36 inches of the normal driving path.

Exception: Where the clear height of the vehicle garage opening is 7 ft 6 in, (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.



~~FIGURE 1207.11.7.1 ESS VEHICLE IMPACT PROTECTION~~

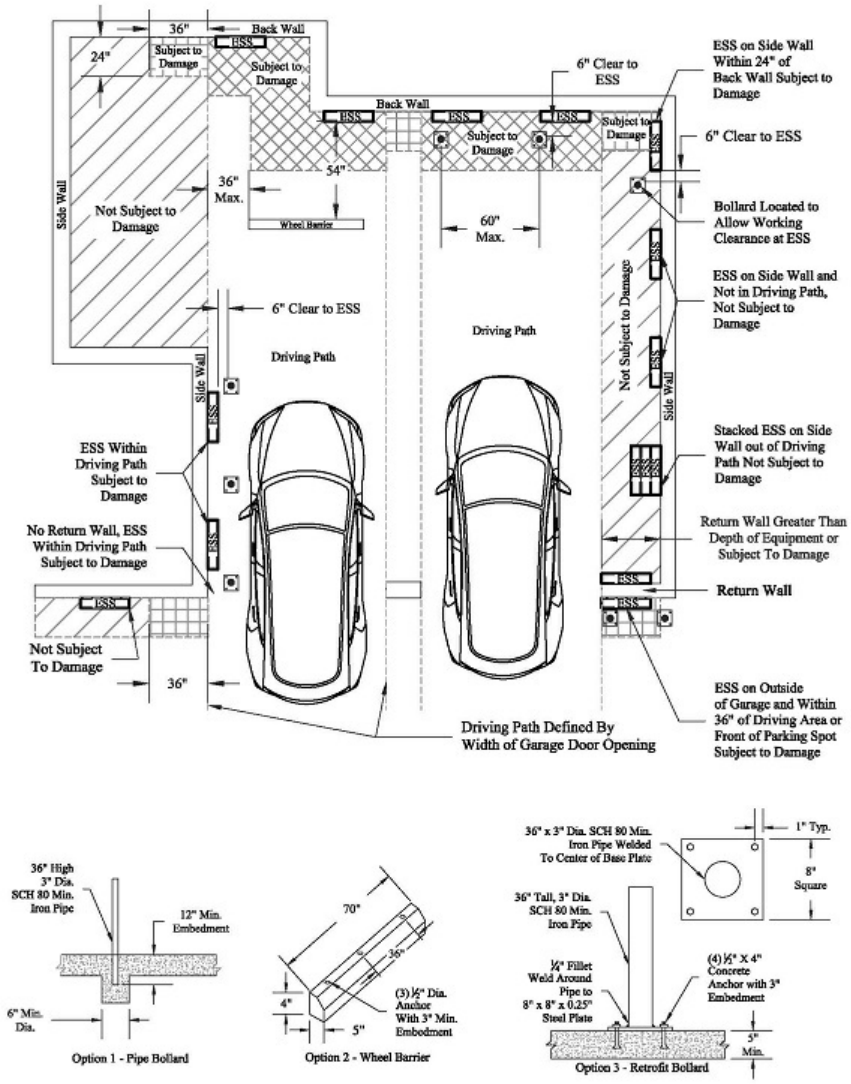


FIGURE 1207.11.7.1 ESS VEHICLE IMPACT PROTECTION

1207.11.7.3 Impact Protection Options . Where ESS is required to be protected from impact in accordance with Section 1207.11.7.1 or 1207.11.7.2 such protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:
   1.1 Minimum 48 inches (1219 mm) in length by 3 inches (76mm) in diameter schedule 80 steel pipe embedded in a concrete pier not less than 12 inches (304 mm) deep and 6 inches (152 mm) in diameter, with at least 36 inches (914 mm) of pipe exposed, filled with concrete, and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.

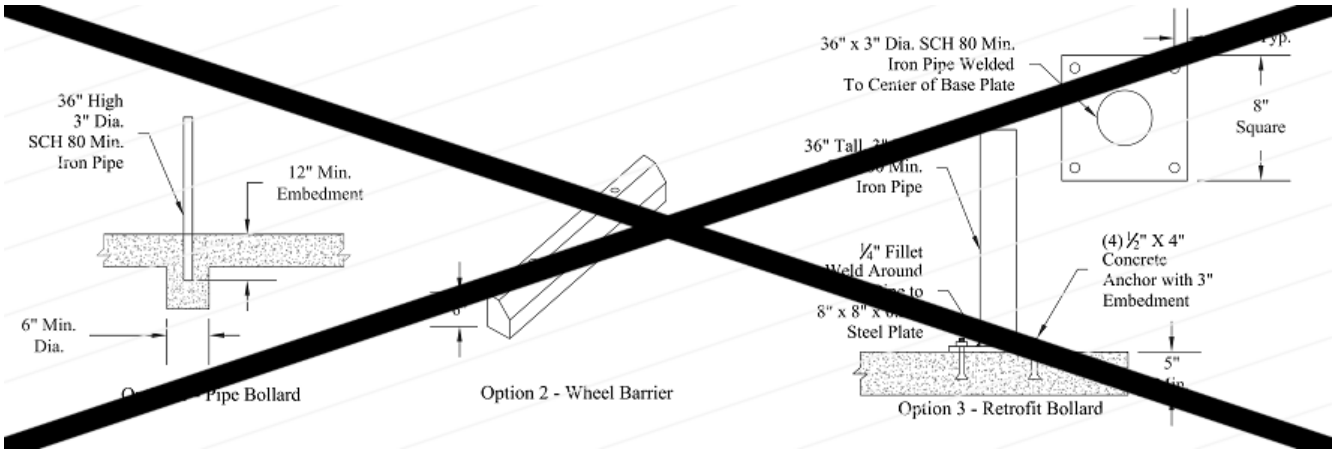
   1.2 Minimum 36 inches (914 mm) in height by 3 inches (76 mm) in diameter schedule 80 steel pipe fully welded to ~~an~~ a minimum 8 inches (203 mm) by ¼ inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of 4 - ½ inch (13 mm) concrete anchors with 3 inch (76 mm) minimum embedment. Spacing shall be not greater than 60 inches. (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.

   1.3 Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than a 60 inches. (1524 mm). Each bollard shall be located ~~Located~~ not less than 6 inches (152mm) from the ESS.

2. Wheel barriers constructed in accordance with one of the following:
   2.1. ~~6 inches (152 mm) in height by 6 inches (152 mm) in width~~ 4 inches (102 mm) in height by 5 inches (127 mm) in width by 70 inches (1778 mm) in length wheel barrier made of concrete or polymer, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS.. Minimum ~~2-2~~(3) - ½ inch (13 mm) diameter concrete anchors with 3 inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be no greater than 36 inches. (914 mm).

2.2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturers installation instructions.

3. Approved method designed to resist a 2000 lbf (8899 Newtons) impact in the direction of travel at 24 inches (608 mm) above grade.



~~FIGURE 1207.11.7.3 IMPACT PROTECTION OPTIONS~~

Commenter's Reason: This public comment is intended to address the following improvements, developed in collaboration between a SEAC working group and NAHB:

1. Improve language in 1207.11.7 to make it more accurately align with the associated Figure. The intent was to describe an area or space, not simply a “line”.
2. Incorporate a suggestion to reduce the “corner” area condition to 36” x 24” based on the geometry of a vehicle approaching at an angle. Important to note that an ESS that is wider than 24” inches when considering any required clearances would trigger the need for a barrier.
3. Clarify which dimensions are minimums and which are maximums; the language as previously approved may be confusing.
4. Further refine the guidance on wheel barriers:

1. Add a length measurement - this was omitted in error. 70” was determined to be commonly available and wide enough to protect against the wheel track of an average passenger vehicle.
2. This 70” length necessitated an additional fastener so the minimum of (2) was increased to (3).
3. Reduce the minimum size based on commonly available pre-made wheel barriers

5. Further refine Figure 1207.11.7.1:

1. Add an ESS on an exterior wall not subject to damage as an example
2. Align terminology - replace “curb stop” with “wheel barrier”
3. Edit corner area dimensions

This public comment 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 net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment clarifies and gives more technical rigor to the requirements.

Public Comment# 2792

F157-21

Proposed Change as Submitted

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)

2021 International Fire Code

Revise as follows:

2310.4 Fueling of marine vehicles at other than approved marine motor fuel-dispensing facilities. Fueling of floating marine craft at other than a marine motor fuel-dispensing facility shall comply with Sections 2310.4.1 and 2310.4.2, and where applicable, Section 5706.5.4.

Reason: This proposal is to tie the two sections pertaining to marine craft fueling together. As the code currently is written, 2310.4 has requirements for fueling marine vehicles at other than approved dispensing facilities, which would include fueling from a tank vehicle, tank car, or mobile fueling vehicle. However, there is no tie to the other sections such as 5706.5.4. Without this tie, 2310.4.1 specifically does not permit Class I fuels at other than a marine motor fuel dispensing facility, but 5706.5.4.1 is not that specific and would appear to allow any liquid fuel, which is likely not the intent. Providing the tie eliminates this discrepancy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no anticipated cost of construction increase. This is intended to simply tie two related code sections together.

F157-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as Section 2310.4 is intended for transfer activities not for fueling and was not intended as on-demand mobile fueling. (Vote: 13-0)

F157-21

Individual Consideration Agenda

Public Comment 1:

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) requests As Submitted

Commenter's Reason: The committee recommendation listed on this proposal indicates that Section 2310.4 is intended for transfer activities and not for fueling. However, the title of Section 2310.4 is "Fueling of marine vehicles at other than approved marine motor fuel-dispensing facilities." The Section goes further to state that "Fueling of floating marine craft at other than a marine motor fuel-dispensing facility shall comply with Sections 2310.4.1 and 2310.4.2."
Lastly, the provisions of Section 2310.4.2 describes, among other things, the requirements for the tank vehicle used to fuel floating marine craft, which includes the vehicle and fueling operations to be in compliance with 5706.6. Although Section 5706.5 is titled "Bulk transfer and process transfer operations," the general Section 5706.5.1 indicates that Sections 5706.5.4 through 5706.5.4.5 shall apply to dispensing from tank vehicles and tank cars, and subsequently, Section 5706.5.4 is dispensing from tank vehicles and tank cars into the fuel tanks of motor vehicles.

Section 5706.5.4.1 then deals directly with liquids intended for use as motor fuels that are transferred from tank vehicles into the fuel tanks of marine craft. This is the same process that is addressed by Section 2310.4.

Other sections of the code link together mobile fueling operations and Section 5706.5.4. For example, the commentary to the definition of “Mobile Fueling” indicates “This definition pertains to the fueling process regulated by Section 5706.5.4.5, wherein fuel is dispensed from the tank vehicle directly to the fuel tank of a vehicle. Also note the requirements in Section 5707 for on-demand mobile fueling (see commentaries, Section 5706.5.4.5 and 5707).

This proposal simply aligns Section 2310.4 and Section 5706.5.4. It does not impose any additional requirements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction There is no anticipated cost of construction increase. This is intended to simply tie two related code sections together.

Public Comment# 2841

F158-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

2404.2 Prohibited enclosures for spray application operations.
Inflatable or portable enclosures shall not be used for spray application of flammable finishes.

Exception: Enclosures for the spray application of flammable finishes in marinas, dry docking areas or construction areas shall comply with 2404.3.

2404.3 Membrane enclosures.
The design, construction, protection, operation and maintenance of membrane Enclosures shall be in accordance with NFPA 33.

Reason: Inflatable or portable enclosures for spray application operations are prohibited as they do not meet the minimum codes set forth for spray booths. Examples of such noncompliance are as follows:
1. Location of spray-finishing operations

2. Construction type not that of noncombustible material

3. Omission of fire protection systems - not protected by an approved automatic fire-extinguishing system

4. Ventilation and filtration requirements

5. Air supported structure collapse with any significant fire incident.Additionally, if an inflatable or portable enclosure is able to meet the intent of the codes applicable to IFC Section 2404 Spray Finishing, a local fire official would have the ability to allow such use as an equivalent alternative.

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
There is not a cost associated with this proposal as current code does not specifically permit temporary and inflatable spray application operations of flammable finishes and this proposal does not change the allowable conditions associated with marinas, dry docking or construction areas.

F158-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as currently the code is silent and enforcement of portable spray booths operations is difficult. The use of portable spray booths is becoming quite prevent and fire code officials need a tool to address. Note that the provisions for limited spray space would allow many smaller operations without further regulation. The key is not allowing portable spray booths to replace permanent code compliant spray booths. NFPA 33 task group is still reviewing this issue as well. (Vote: 14-0)

F158-21

Individual Consideration Agenda

Public Comment 1:

IFC: 2404.2, 2404.3

Proponents: Paul Armstrong, representing IFAI (paul@7arms.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

~~**2404.2 Prohibited enclosures for spray application operations.**~~
~~Inflatable or portable enclosures shall not be used for spray application of flammable finishes.~~

~~**Exception:** Enclosures for the spray application of flammable finishes in marinas, dry docking areas or construction areas shall comply with 2404.3.~~

~~**2404.3**~~ **2404.2 Membrane enclosures .** The design, construction, protection, operation and maintenance of membrane ~~Enclosures~~ enclosures used for spray application of flammable finishes shall be in accordance with NFPA 33.

Commenter's Reason: During testimony at the CAH, it was noted that the point of this initial proposal is for inflatable, portable or permanently installed membrane enclosures to comply with the provisions of NFPA 33. NFPA 33 provides the necessary protection for the spray application of flammable finishes and is referenced for other types of installations. In this case, if any membrane enclosure that doesn't comply is proposed for installation and use, it should be not allowed. It was also noted that there is a submittal to the NFPA 33 committee to address inflatable and portable membrane enclosures, this makes the first new section and exception unnecessary and a general reference to compliance for all such membrane enclosures with NFPA 33 much more clean and to the point.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This will recognize the application of NFPA 33 for these membrane structures.

Public Comment# 2880

F165-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

3103.9.1 Water Filled Vessels.
Water filled vessels shall not be used to anchor a tent or membrane structure unless approved and in accordance with the tent or membrane structure manufacturer's instructions.

Revise as follows:

3103.6 Construction documents. A detailed site and floor plan for *tents* or *membrane structures* with an *occupant load* of 50 or more shall be provided with each application for approval. The *tent* or *membrane structure* floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment. The *construction documents* shall include an analysis of structural stability. Water filled vessels used to anchor a tent or membrane structure shall be in accordance with Section 3103.9.1.

Reason: The use of water filled barrels as anchors has long been problematic. With a great deal of variance in how water filled barrels react based on connections, fill amounts, and connection of straps to the barrel itself, it is the intent of this code proposal to ensure that manufacturers of tents and membrane structures dictate how water barrels may be used to anchor their products, taking a local entity out of the equation.
Tent safety as performed by the tent installer is a very complicated issue and has an enormous number of variables. Many different factors go into proper anchoring of tents and many of those have scientific bases; but because each factor has an influence on the other factors the science can get very confusing.

To give an example of the variables involved, here is a short list

Surface (concrete, dirt, asphalt, grass, other)

Size of tent

Type of stake

Distance from tent of stake

Geometry of staking pattern

Angle of stake/strap

Number of stakes/straps

Stake/Strap connection method

Type of soil

Moisture level in soil

Construction of strapping or rope

Quite often tents are set up on concrete. The ideal method would of installation on concrete are concrete anchors. These anchors are very strong. Depending on the condition and age of the concrete the failure pressure of this type anchor is anywhere from 2000 to 3000 lbs. or more. This is as close to ideal as you are going to get in the tent business.

Unfortunately for several reasons the property owner will not allow drilling and placement of concrete anchors.

"Water Barrels" are commonly used to secure tents. This is the method most often misused.

A typical water barrel holds 50 gallons of water. Water weighs about 8.34 lbs. per gallon. So, the actual weight of a water barrel is about 420 lbs. Not nearly sufficient weight for holding down a large tent. A water barrel has a plastic bottom that tends to slide if pressure is applied. Water barrels are tied at the top, leaving your pressure point about 40" up (should be at absolute ground level). Water barrels also tend to tip over and spill their contents, effectively causing you to lose ballast.

If we have a 40x40 frame tent we will need a minimum of 16,000 lbs. of holding capacity to safely secure this tent in normal conditions. That means in the best of conditions we would need over 60 water barrels to secure one single 40x40 tent.

We can conclude that water barrels are not a good alternative for securing tents. And many municipalities have recognized that and no longer allow the use of water barrels. Safety and liability are the key factors. Most tent and membrane manufactures do not recommend water barrels do to the following reasons: Water barrels have a low coefficient of friction, reduce weight effectiveness to other methods, have a larger quantities of water barrels to other methods, the tie off location affect the amount to uplift that the barrel may withstand.

For those manufacturers who would allow the use of water barrels for anchoring of their tents, a provision has been made to allow for the tent manufacturer to provide the documentation on their use.

For more information and videos please see the link below https://www.gettent.com/content/water-barrels-deadweights.asp

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost of construction will not change since the option to use the water filled vessel is still allowed if approved by the manufacturer.

F165-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reasons for approval were that this will improve the anchorage of tents and membrane structures and as a code official, calling out the water barrels as being prohibited really is necessary otherwise the presumption is you know that it's equivalent in terms of its anchoring capacity. Additionally, it was noted that in reviewing some of the manufacturers specifications, they don't necessarily say exactly how to anchor them, they just say they shall be anchored and this addresses specifically how we don't want them to be anchored. (Vote: 14-0)

F165-21

Individual Consideration Agenda

Public Comment 1:

IFC: 3103.9.1

Proponents: Paul Armstrong, representing IFAI (paul@7arms.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

3103.9.1 Water Filled Vessels. Water filled vessels shall be permitted to be used when ~~not be used to anchor a tent or membrane structure unless~~ approved and in accordance with the tent or membrane structure manufacturer's ~~instructions~~ load specifications.

Commenter's Reason: This simple revision clarifies that Tent manufacturer's information only provides the staking or ballasting load since they do not know the soil or surface conditions where the tent is intended to be installed. It is the responsibility of the installer to determine the appropriate method and to obtain the approval of the local authority having jurisdiction. This also changes the tone from what shall not be used to what is permitted.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The effect of this revision is to clarify the tent manufacturer's information to be used.

Public Comment# 2876

F170-21

Proposed Change as Submitted

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

3206.7 Fire department access doors. Where fire department access doors are required by Table 3206.2, fire department access doors shall be provided in accordance Sections 3206.7.1 through ~~3206.7.8.~~ 3206.7.7.

3206.7.1 ~~Exterior walls without fire department access doors~~ Where Located. ~~Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road provided that all of the following conditions occur:~~
Where exterior walls surrounding high-piled storage areas face fire apparatus access roads, such walls shall be provided with fire department access doors. Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road.

Exception: Fire department access doors are not required in an exterior wall that faces a fire apparatus access road provided that all of the following conditions exist:

1. The opposite exterior wall faces a fire apparatus access road.
2. The opposite exterior wall is provided with fire department access doors.
3. The entire interior surface of the exterior wall is less than 150 feet (45 720 mm) away from a fire department access door.
4. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~**3206.7.2 Where located.** Where exterior walls surrounding *high-piled storage areas* face fire apparatus access roads, such walls shall be provided with fire department access doors.~~

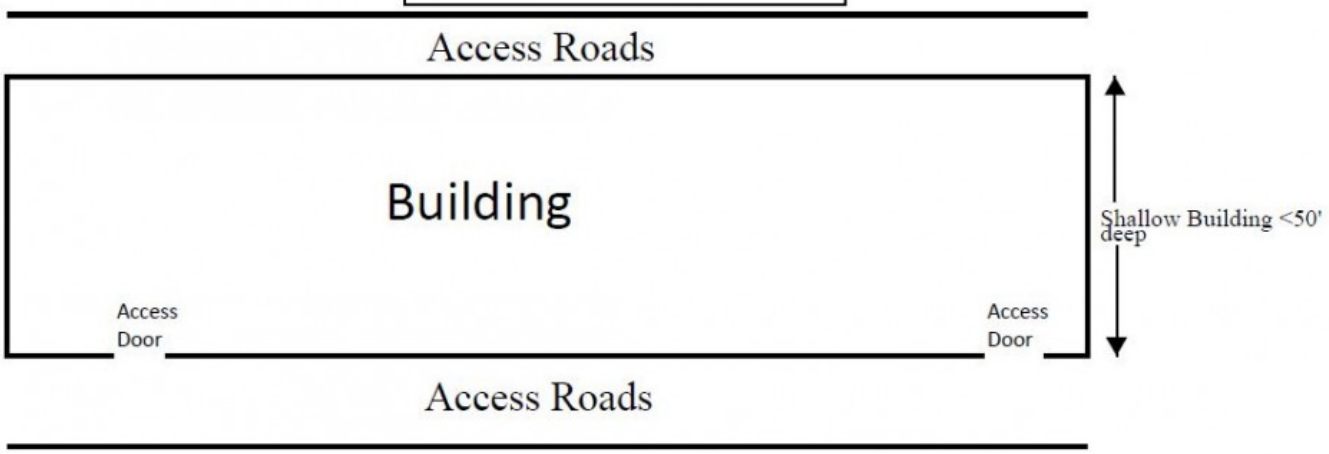
Reason: Please see Figure 1 below as an example of what the intent of this code change is. The language as it's currently written is impractical for the following reasons:
1. Section 3206.7.1 (access doors are required where exterior walls do NOT face an access road unless conditions 1-4 are met) is in conflict with Section 3206.7.2 (access doors are only required where exterior walls face an access road).

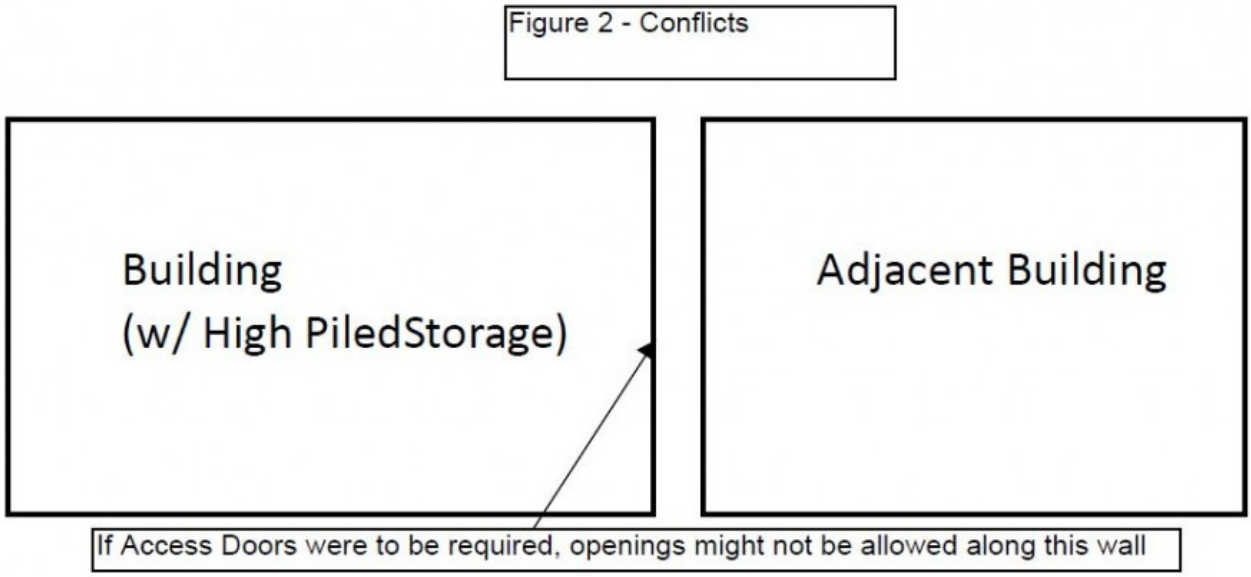
2. Access from a side of a building that does not have an access road is impractical. The building in most cases is small enough not to require access roads along one side of the building, thereby allowing access from other sides due to the size of the building.

3. This will create a problem in existing buildings when one business moves out and another moves in, thereby forcing the new tenant to cut holes in exterior building walls.

4. If the side of the building that does not require access roads abuts another building, then in many cases openings are not allowed along that side of the building, thereby creating a conflict in the code. Please see Figure 2 below as an example.

Figure 1 - Example of the Intent





Cost Impact: The code change proposal will decrease the cost of construction
The revisions clarify the code and eliminate conflicts in the requirements to provide access doors in an exterior wall that does not face a fire apparatus access road or abuts another building.

F170-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that if you have a wall that does not face an access road, but the opposite of it does, then you don't have to put the doors in. It is taking something out that is going to make it much more difficult and it doesn't seem like there's a conflict in the current language. Additionally, it was noted that the original code language says where it does not face an access road and the concern is that code officials who are going to look at these buildings and then say you do have to put in access roads. (Vote: 10-4)

F170-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Submitted

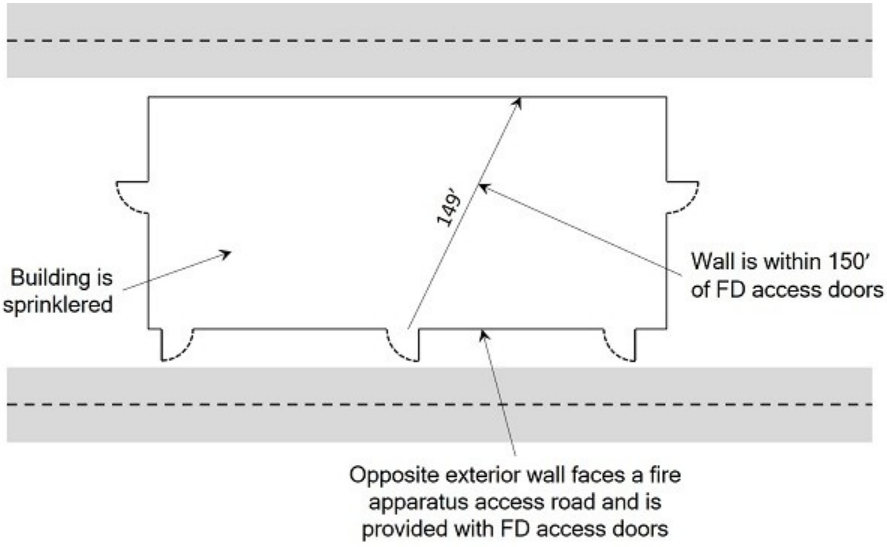
Commenter's Reason: It is unfortunate that the recent rewrite to Chapter 32 created an unintentional conflict for the requirements for fire department access doors. The original proposal was designed to remedy this conflict, however, it is such a subtle conflict that the Code Development Committee did not recognize that the conflict exists. This Public Comment urges Approval as Submitted.
IFC Sections 3206.7.1 and 3206.7.2 each work fine as stand alone sections. It is when you attempt to apply them together that the conflict occurs. Current text in IFC Section 3206.7.2 only requires FD access doors in exterior walls facing a fire apparatus access road. This means that if an exterior wall does not face an access road, then FD access doors are not required. This section is very clear, however, Section 3206.7.1 states that the FD access doors can only be eliminated if a list of criteria is met in addition to the fact that it does not face an access road. So one section says FD access doors are not needed and the other section says the FD access doors are not needed if you meet certain criteria. The list of criteria is actually intended to be an exception allowing an exterior wall of a narrow building to be without FD access doors.

The original code change reformatted these requirements into a logical and correlated order.

IFC Section 3206.6 requires that all portions of the exterior wall of the building must be within 150’ of a FD access road. This distance to an access

road is not relaxed with the installation of fire sprinkler system as it is in other buildings. So all portions of the exterior wall need to be within 150' of an access road, but when the building is small enough, FD access doors are not required on all sides of the building when adequate access is provided from the other FD access doors.

If all portions of one exterior wall are within 150' of FD access doors, additional FD access doors are not required in that one wall. See diagram below.



Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This Public Comment clarifies the requirements currently in the code.

Public Comment# 2556

F174-21

Proposed Change as Submitted

Proponents: David Tyree, representing AWC (dtyree@awc.org); Raymond O'Brocki, AWC, representing AWC (robrocki@awc.org)

2021 International Fire Code

Revise as follows:

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

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

   ~~**Exception**~~ **Exceptions:**

   1. Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.
   2. Noncombustible material on the top of mass timber floor assemblies shall not be required before erecting additional floor levels.

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

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

Reason: Applying at least one layer of the required noncombustible protection to mass timber walls and ceilings as construction progresses in height is an important component of fire safety during construction. This code requirement was informed by the experience at Brock Commons, the 18-story tall mass timber building in Vancouver, British Columbia. Less critical, and more problematic for builders, is applying the noncombustible topping on CLT floors during construction. The fire service in Vancouver did not require the CLT floors to be covered with gypcrete as the building progressed in height. They believed that it would add little fire protection and that the protection of the walls and ceilings were much more critical to the fire safety of the building than the floors.
The requirement to place the noncombustible protection over the mass timber floor panels per IFC 3303.5 before construction proceeds more than four stories above is impracticable. Enacting the 4-story trigger creates undue hardships and constructability nightmares. Some projects are looking to place up to 2" of non-structural topping on the floor panels and placing conduit within the topping to run "under the finished floor" but above the exposed mass timber underside. To place conduit in this area while the mass timber superstructure is going vertical creates many challenges. The weight of loaded drywall carts needed later in construction to finish out the required protection for other surfaces may cause damage to the conduit and gypcrete. In addition, gypcrete does not wear well in inclement weather. In most, if not all cases, the building will not be watertight as the building goes higher while placing gypcrete underneath. Damaged gypcrete affects sound ratings and could cause adhesion problems for flooring above the cracked gypcrete. Perhaps most important, requiring the gypcrete topping to be installed earlier than the normal construction sequencing calls for effectively requiring the metal stud framing, drywalling, and mechanicals/electrical/plumbing rough-ins to be completed before the gypcrete can be permanently installed. This significantly affects the critical path of construction scheduling and greatly diminishes normal scheduling savings.

The 4-story trigger for floor protection creates significant additional costs by adversely affecting the speed of construction. Compared to the obvious safety benefits of protecting walls and ceilings during construction, the benefits of protecting floors is much less critical. Therefore, the inordinate difficulty and cost associated with the current requirement justifies this proposed exception.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will reduce the construction cost by increased efficiencies and reduced construction times.

F174-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as it addresses the concern that the risk from exposed floors during construction was low and provides a more practical approach. There was some concern that the term "floor levels" may be confusing in this application. Additionally, the exception, as written, may go further than anticipated in terms of scope of application. (Vote: 9-4)

F174-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Shamim Rashid-Sumar, representing National Ready Mixed Concrete Association (ssumar@nrmca.org) requests Disapprove

Commenter's Reason: F174-21 is recommended for disapproval based on several technical concerns regarding the proposed exception to combustible protection for floors in Type IV buildings under construction.
The proponents of the code change have argued that heat stress in a compartment fire on the floor is minimal, and that the fire hazard and combustibility presented by the horizontal floor surface does not warrant the need for a noncombustible material during the construction phase. However, this argument neglects re-radiation between adjacent surfaces including between ceilings and floors which occurs during a fire. Hence the code requires flooring to be subject to an incident heat flux from a flooring radiant panel to confirm compliance. Additionally, noncombustible protection is clearly required by Section 602.4 for floors and undersides of floors in Type IV construction.

The reference to “floor levels” in the proposed code change is problematic in that it is confusing in application, and as written, may be expanded beyond what is intended in terms of scope of application. Finally, the removal of safety provisions from Type IV buildings under construction is premature based on the relatively recent addition of the tall wood building provisions to the code and the lack of building history for CLT structures in jurisdictions where the IBC has been adopted.

Recommend DISAPPROVAL for F174-21.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2834

F175-21

Proposed Change as Submitted

Proponents: Jeff O'Neill, representing American Society of Health Care Engineers (ASHE) (jeff.oneill@uphs.upenn.edu); Andrew W.J. Kollar, Self / Fused Studios P.C., representing Self (akollar@fusedstudios.org); Wayne Jewell, Green Oak Charter Township, representing Self (wayne.jewell@greenoaktwp.com)

2021 International Fire Code

Add new definition as follows:

HEALTH CARE LABORATORY. . Laboratories used for to support the health care facilities through testing, analysis, research or developmental activities on a nonproduction basis including diagnostic, clinical and hospital laboratories.

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

Revise as follows:

LABORATORY SUITE. A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a ~~Group B educational occupancy~~ *higher education* or *health care laboratory*, that are permitted to include ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Chapter 38.

CHAPTER 38
HIGHER EDUCATION AND HEALTH CARE LABORATORIES

3801.1 Scope. *Higher education* and *health care laboratories* complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in *control areas* set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the *International Building Code*.

3802.1 Definitions. The following terms are defined in Chapter 2:
CHEMICAL FUME HOOD.

GLOVE BOX.

HEALTH CARE LABORATORY.

HIGHER EDUCTION LABORATORY.

LABORATORY SUITE.

SPECIAL EXPERT.

3804.1.1.6 Standby or emergency power. *Higher education* and *health care laboratory suites* shall be provided with emergency or standby power in accordance with Section 1203.2.14.

5003.8.3 Control areas. *Control areas* shall comply with Sections 5003.8.3.1 through 5003.8.3.5.3.

Exception: *Higher education* and *health care laboratories* in accordance with Chapter 38 of this code and Section 428 of the International Building Code.

2021 International Building Code

Add new definition as follows:

HEALTH CARE LABORATORY. . Laboratories used for to support the health care facilities through testing, analysis, research or developmental activities on a nonproduction basis including diagnostic, clinical and hospital laboratories.

Revise as follows:

[F] HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or

developmental activities on a nonproduction basis.

[F] LABORATORY SUITE. A fire-rated, enclosed laboratory area providing one or more laboratory spaces within a a higher education laboratory or a health care laboratory ~~Group B educational occupancy~~ that includes ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Section 428.

[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*~~ *Higher education* and *health care laboratories* ~~*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.*

[F] 414.2 Control areas. *Control areas* shall comply with Sections 414.2.1 through 414.2.5 and the *International Fire Code*.

Exception: *Higher education* and *health care laboratories* in accordance with Section 428 and Chapter 38 of the International Fire Code.

SECTION 428
HIGHER EDUCATION AND HEALTH CARE LABORATORIES

[F] 428.1 Scope. *Higher education* and *health care laboratories* complying with the requirements of Sections 428.1 through 428.4 shall be permitted to exceed the maximum allowable quantities of *hazardous materials* in *control areas* set forth in Tables 307.1(1) and 307.1(2) without requiring classification as a Group H occupancy. Except as specified in Section 428, such laboratories shall comply with all applicable provisions of this code and the *International Fire Code*.

Reason: First, we wish to acknowledge the efforts put forth by the Fire Code Action Committee (FCAC) and the people who worked to put together the original code change that introduced “higher education laboratories” in F340-16. That effect successfully put in place much needed regulations to address the use of hazardous materials in what are highly monitored conditions without production – laboratories in higher education institutions, by providing enhanced safety requirements.
But as was the situation prior to the approval of F340-16 and the introduction of regulations for higher education laboratories in what is now Chapter 38 in the IFC and Section 428 in the IBC, the I-Codes still do not do not specifically provide or address how to regulate those laboratories that by all accounts operate the same as a “higher education laboratory” but cannot be classified as a “higher education laboratories” because they are

not used for educational purposes above the 12th grade." Because of this, users must try to apply general hazardous materials provisions, which oftentimes are not appropriate for clinical, diagnostic or research laboratory settings.

After being in the 2018 and 2021 codes, users have had a chance to really review and come to understand the provisions that are found in Chapter 38 of the IFC and Section 428 in the IBC. And although we do not disagree with any of the logic that the FCAC gave in the Reason statement for F340-16 for the key parameters that must be present, we do not see any technical reasons for why those provisions are should be limited to only higher education laboratories. This code change seeks to expand the application of the provisions in Chapter 38 of the IFC and Section 428 in the IBC to not just higher education laboratories but to any clinical, diagnostic or research laboratory that meets the criteria contained in those sections – what we are proposing be categorized as "health care laboratories

As was stated in the Reason statement to F340-16 "The advance of technologies, science, medicine and our knowledge of the world often relies on having vibrant and successful academic institutions." But the laboratory settings in which those advances occur are NOT limited to only those that come out of an academic institutions (high-learning institution) – they come out of laboratories found in the private sector and the nationally-funded sectors also. The perfect example is the research that is happening right now with the race to solve the COVID-19 crisis. Most of the work involved is coming out of laboratories in that are not in a higher education sector.

In their Reason statement for F340-15 the FCAC put forth what they saw as the "conditions typically present in academic laboratories that make them unique," but which when looked at on their own merits are conditions or characteristics also found in non-academic, non-production laboratories in other occupancies including hospitals, clinical, research and diagnostic areas. The FCAC included:

1. Lower chemical density in individual research laboratories.

"…there are often many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area. This lower chemical density often mitigates the overall risk, but the IFC currently has no provisions to recognize this condition."

1. Ongoing staff oversight from "Special Experts" in laboratory safety.

"…"have a full cadre of faculty and staff with chemical expertise. These "Special Experts" often include, but are not limited to: Fire Marshals, Industrial Hygienists, Radiation Safety Officers, Biological Safety Officers, Chemical Hygiene Officers and Environmental Health and Safety Officers. These individuals are an integral part of the preparation/review of laboratory safety documentations, as well as regularly scheduled safety audits."

1. Mixed-use occupancies.

"…building will house laboratories, office space, storerooms, classrooms and lecture halls. The current limits on hazardous materials are so restrictive on upper floors that many universities are forced to locate classrooms and lecture halls on the upper floors so that they can take full advantage of the hazardous materials quantities allowed on the lower floors. This results in moving large numbers of students through hallways, past laboratories to get to the upper floors. They will also have to exit back down the same routes in the event of an emergency."

All of these are valid conditions and important principles to use when deciding which the types of laboratories should be allowed to use the provisions in IFC Chapter 38 and IBC Section 428. But these conditions and logic are not limited to only those laboratories found in higher education institutions – rather a laboratory found in an institution of higher learner is only one of many types of laboratories that meets the conditions and principles. When each of the "conditions" is reviewed it really becomes obvious that they are not unique to academic (higher education) laboratories.

This proposal is based on the fundamental concept that it should not be the laboratory "setting" which drives the scope of IFC Chapter 38 (IBC Section 428), i.e., higher education vs private clinical, but rather it should be the characteristics and design of the laboratory. The same philosophy the I-Codes uses to engage the requirements for the hazardous materials provisions in general should be used to engage the requirements for use of IFC Chapter 38. The distribution and density of materials, the physical constraints and the qualification of on-site personal are all "conditions" that are also found in non-academic laboratories which do not support production or processing.

Many non-academic laboratories (think diagnostic and clinical) are designed in the same way higher learning laboratories are, and are made up of [to quote F340-16] "…many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area." If so, then it is logical that they should be able to use the provisions in IFC Chapter 38?

Regarding the topic of "oversight" from special experts, the logic FCAC present is not unique to higher education laboratories. It is also very true for most non-academic laboratories (such as hospitals and testing organizations) because they are mandated through state and federal agencies.

Regarding the topic of "mixed occupancy," while most post-secondary academic laboratory do occur in what are deemed to be "mixed occupancy," so are most non-academic laboratories. A perfect example is that of a hospital – while the primary occupancy is Group I-2, almost every hospital also contains other occupancies such as storage/utility areas, kitchens, dining facilities, office space, and clinical laboratories.

The one condition FCAC included in their Reason statement that when closely examined was a double-edged sword was:

1. Limited, or "directed", funding streams. Also unique to academic institutions are the funding sources for research. In a "non-profit" teaching and research environment, the majority of research is funded through grants and endowments. Unfortunately, many grants only support the costs of research personnel and equipment, not structural upgrades to accommodate newer research processes.

While a limited funding stream is portrayed as a justification for implementing new regulations for laboratories associated with academic institutions, a good funding stream is actually a benefit because it allows a non-academic laboratory to be equipped with the newest equipment – both for laboratory experiments and for the protection of the occupants. Logic says that because of good funding non-academic laboratories may operate in a safer environment.

We also assert that there is a fifth condition that was present in the development of the code language in F340-16, and should be acknowledged, one that is fundamental:

1. The activities in a laboratory are not part of a production process, nor in any way simulate a production process.

Without the code change contained herein, jurisdictions will still have to do the same thing for non-academic laboratories as they have been – making state or local amendments to allow for greater numbers of control areas and larger percentages of MAQs in non-production laboratories. Code Change F340-16 bought higher education laboratories into the codes and provides the AHJ with rules but there still are no unique rules for non-academic laboratories. This proposal seeks to build on the work the FCAC did in F340-16 and provide standardized model code language to address this topic for both academic (higher education) and non-academic laboratories.

To allow non-academic laboratories to use these regulations the following revisions are proposed:

- Replace the definition of “higher learning laboratories” with “non-production laboratories;”
- Revise IFC Chapter 38 to use the new designation of “non-production laboratories”
- Revise IBC Section 428 to use the new designation of “non-production laboratories”
- Coordinate the various sections in the IFC and IBC to use the new designation of “non-production laboratories”

For those interested in the history of this topic and Code change F340-16, please visit the ICC Code Development Archives at https://www.iccsafe.org/products-and-services/i-codes/code-development/2015-2017-code-development-cycle/

Cost Impact: The code change proposal will decrease the cost of construction
By complying with the provisions in IFC Chapter 39 small non-academic, non-production laboratories will be classified as a Group B occupancies rather than a Group H occupancy. However, many of the non-production labs that this change would cover would seek variances to be in B-occupancies, thus avoiding the impacts of being classified as H-occupancies. Therefore, savings are in reality very slight for those areas (ie: hospital labs, commercial diagnostic labs such as Qwest or LabCorp).

Staff Analysis: This proposal addresses requirements in a different or contradicting manner to those found in Code Change 7075. The committee is urged to make their intentions clear with their actions on these proposals.

F175-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as the increase in scope was viewed not within the original intent of the provisions. There was a concern that the increased scope would allow this concept in buildings containing non ambulatory patients. This proposal as written would not limit health care laboratories to Group I-2 occupancies. In addition, it was felt that clinical laboratories need to be defined. Finally, it was noted that the broadening of this scope was turned down in 2018. (Vote: 13-1)

Staff Analysis: This proposal addresses requirements in a different or contradicting manner to those found in Code Change F176-21. The committee
is urged to make their intentions clear with their actions on these proposals.

F175-21

Individual Consideration Agenda

Public Comment 1:

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Submitted

Commenter's Reason: The intention of this code change is to utilize the same lab space requirements already approved, in a similar occupancy setting. This proposal does not contradict requirements approved for Higher Educational Labs, but simple expands them to clinical labs. The same requirements are routinely sought, and approved, for hospital labs. This concept is already utilized in the California Building Standards Code, Laboratories group "L" occupancy; Chapter 4, Special Detail Requirements, Section 453."
Operationally, it was mentioned in committee debate that a lab and inpatient beds would somehow occupy the same space. This notion is false. The Incidental Use Table already requires a one-hour separation between clinical labs and all other spaces of the facility, regardless of sprinklering status. Usually, clinical labs occur in lower levels of the hospital, reserving spaces with windows for patient care, especially on bed units where an outside window is required. Labs routinely are adjacent to other support areas, and are multiple floors away from patient care.

The distinction between production labs and clinical labs is profound. The best way to paint this picture is using the COVID-19 pandemic as an example. Rapid testing, based on nasal swabs, are processed in clinical labs using non-hazardous reagents. These clinical labs are common in hospitals, and the main concern is with wasting the tissue and bodily fluid samples, and not hazardous waste. Millions of doses of vaccines, at pharmaceutical plants, are generated from production labs, where hazardous waste is the main concern.

Regulation around clinical labs is at least equal, to even greater, than Higher Educational Labs. Quantities of any hazardous chemical inventory is required to be reported to a hospital Environment of Care Committee, normally chaired by the hospital Safety Officer. The quantities regularly reported in this setting is appropriate for the conditions of this code change. This regulatory structure at a hospital is required as a Condition of Participation with the Centers for Medicare and Medicaid Services (CMS). Any clinical lab receiving reimbursement from the federal government (which is most) are subject to these regulatory conditions, without exception.

For these reasons, there is no reason that Higher Education Laboratory functions are a unique carve-out that can be subject to sound reasoning around the handling of hazardous materials in a laboratory setting.

This public comment is submitted by the Committee on Healthcare (CHC).

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 and 2021 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 net effect of the public comment and code change proposal will decrease the cost of construction
By complying with the provisions in IFC Chapter 39 small non-academic, non-production laboratories will be classified as a Group B occupancies rather than a Group H occupancy. However, many of the non-production labs that this change would cover would seek variances to be in B-occupancies, thus avoiding the impacts of being classified as H-occupancies. Therefore, savings are in reality very slight for those areas (ie: hospital labs, commercial diagnostic labs such as Qwest or LabCorp).

Public Comment# 2590

F183-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

3903.5 Use of flammable and combustible liquids. Where ~~The use of~~ *flammable* ~~and~~ or *combustible* ~~*liquids*~~ solvents are used for ~~liquid~~ extraction processes , such processes ~~where the liquid is boiled, distilled or evaporated~~ shall be located within a chemical ~~hazardous exhaust~~ fume hood, listed or approved ~~rated~~ for exhausting flammable vapors. Electrical equipment used within the ~~hazardous exhaust~~ chemical fume hood or enclosure shall be listed ~~rated~~ for use in flammable atmospheres and installed in accordance with NFPA 70. ~~Heating of *flammable* or *combustible liquids* over an open flame is prohibited.~~

~~**Exception:** The use of a heating element not rated for flammable atmospheres, where documentation from the manufacture, or *approved* testing laboratory indicates the element is rated for heating of *flammable liquids*.~~

Reason: The proposed change is to clarify that the use of either flammable or combustible solvents shall be within a listed or approved fume hood or enclosure. Currently many such processes occur in a room not specifically designed for potentially flammable atmospheres. Clarification of electrical requirements within these spaces is also provided.
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 increase is expected as appropriate fume hoods or enclosures should already be provided with appropriate electrical per NFPA 70.

F183-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Although the proposal is heading right direction the proposal as written does not currently address the the intent clearly. It was preferred that the provisions simply point to other portions of the code such as Chapter 57 as Chapter 39 was generally already structured that way. (Vote 14-0)

F183-21

Individual Consideration Agenda

Public Comment 1:

IFC: 3903.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Fire Code

3903.5 Use of flammable and combustible ~~liquids~~ solvents . The use of *flammable* and *combustible liquids* for ~~liquid~~ extraction processes where the liquid is boiled, distilled or evaporated shall be located within ~~a hazardous~~ an exhaust fume hood or other area provided with exhaust ventilation in accordance with Section 5005.1.9.~~, rated for exhausting flammable vapors~~. Electrical equipment shall be in accordance with Section

603 ~~used within the hazardous exhaust fume hood shall be rated for use in flammable atmospheres. Heating of *flammable* or *combustible liquids* over an open flame is prohibited~~.

~~**Exception:** The use of a heating element not rated for flammable atmospheres, where documentation from the manufacture, or *approved* testing laboratory indicates the element is rated for heating of *flammable liquids*.~~

Commenter's Reason: In response to committee comments the language was revised to clarify the intent for exhaust ventilation where flammable vapors might be present and provides pointers to relevant sections related to exhaust requirements within the fire code. This is a replacement proposal working directly from the 2021 IFC language.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This allow options beyond exhaust fume hoods so should not increase costs.

Public Comment# 2507

F184-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

3903.7 Means of Egress.
Means of egress from rooms or areas used for extraction shall swing in the direction of egress travel.

3903.7.1 Illumination.
Means of egress illumination within extraction rooms or areas shall be provided with emergency power in accordance with Section 1008.3.

Reason: This section is added based on incidents in the industry, which have demonstrated the need for a quick and unimpeded exit access from extraction rooms. Incidents with flammable gas fires develop rapidly and broadly, which requires immediate action and movement from personnel impacted.In the event of a power outage a clear egress path is critical as these rooms have equipment and chemicals that could create a secondary risk to the occupant.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Door swing will not impact construction costs and is an easy life safety improvement. The addition of a standard emergency light would be a negligible cost impact (typical light fixture $300-400) along with an additional electrical connection when constructing the room.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal was disapproved as there is concern that there is too much focus on some issues and not others in Chapter 39. This can give the impression that other code requirements, that are still applicable, are not required since they are not discussed in Chapter 39. There was some concern that the egress component of this proposal should remain as it is a specific need not addressed currently by Chapter 10. (Vote: 8-6)

Individual Consideration Agenda

Public Comment 1:

IFC: 3903.7, 3903.7.1

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

3903.7 Means of Egress . ~~Means of egressegress from~~ Exit and exit access doors from rooms or areas used for extraction shall swing in the direction of egress travel.

~~**3903.7.1 Illumination** . Means of egress illumination within extraction rooms or areas shall be provided with emergency power in accordance with~~

~~Section 1008.3.~~

Commenter's Reason: This Public Comment modifies the proposal and retains only the requirement for means of egress from extraction rooms. Extraction rooms present a higher hazard than the remainder of the facility, especially where flammable gases are used as the extraction medium. The requirement to swing the door in the direction of travel is a logical provision based on this increased hazard.

The proposal has been modified to specifically address the exit door or exit access door in the extraction room, rather than the means of egress in general. So this Public Comment only affects the doors in the extraction room, not the entire means of egress path from the extraction room. Once the occupant is out of the extraction room, the remaining path of egress travel will be based on the requirements for the facility as a whole.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The cost of construction should not be affected by this change. The exit door or exit access door is already provided for the extraction room and this proposal simply changes the direction of swing for that door.

Public Comment# 2560

F186-21 Part I

Proposed Change as Submitted

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

THIS IS A TWO PART CODE CHANGE. PART 1 OF THIS PROPOSAL WILL BE HEARD BY THE FIRE CODE COMMITTEE AND PART 2 OF THIS PROPOSAL WILL BE HEARD BY THE BUILDING CODE GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

2021 International Fire Code

SECTION 4005
FIRE PROTECTION

Delete without substitution:

~~**4005.1 Automatic sprinkler system.** The storage of distilled spirits and wines shall be protected by an *approved automatic sprinkler system* as required by Chapter 9.~~

Add new text as follows:

4005.1 Palletized storage of distilled spirits in wooden barrels.
The palletized storage of distilled spirits shall be protected by an *approved automatic sprinkler system* installed throughout the building in accordance with Section 903.3.1.1 as modified in this section.

4005.1.1 Storage height.
Palletized storage arrays of barrels stored on-end shall be limited to a maximum of 7 pallets high.

4005.1.2 Flue spaces.
Flue spaces with a minimum width of 6 inches (152 mm) shall be maintained between adjacent pallets.

4005.1.3 Loading aisles.
Palletized storage that is provided with a defined loading aisle between pallet storage areas shall be arranged using one of the following:

1. Draft curtains, installed in accordance with Section 4005.1.3.1, shall be provided along the side of palletized storage facing the loading aisle to separate the quick response sprinklers and standard response sprinklers.
2. A trench drain shall be provided on each side of the loading aisle, arranged to capture any spilled distilled spirits in the aisle space and remove them from the building to prevent spills from spreading into the barrel storage area.
3. Barrels shall be banded on each pallet to prevent barrels from falling off pallets during transportation and loading into the storage racks.

4005.1.3.1 Draft curtains.
Where installed in accordance with Section 4005.1.3, Item 1, draft curtains shall be designed and construction in accordance with Sections 4005.1.3.1.1 through 4005.1.3.1.3.

4005.1.3.1.1 Construction.
Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved noncombustible materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be designed to resist the passage of smoke.

4005.1.3.1.2 Location.
Draft curtains shall be located along loading aisles serving storage areas.

4005.1.3.1.3 Depth.
Draft curtains shall extend vertically downward from the ceiling for a minimum distance of 20 percent of the ceiling height measured from the floor, with a minimum depth of 6 feet (1829 mm).

4005.1.4 Automatic sprinkler system design.
Storage heights and automatic sprinkler densities for palletized on-end barrels shall in accordance with Table 4005.1.4 and Sections 4005.1.4.1 through 4005.1.4.6.

TABLE 4005.1.4 Palletized Storage of Distilled Spirits with up to 75% Alcohol by Volume in Wooden Barrels

Protection Area	Ceiling Sprinkler Protection					
	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Response / Nominal Temperature Rating / Orientation	K-factor gpm/psi$^{1/2}$	Design[a], # of Sprinklers @ Pressure (psi)
Barrel Storage	Wet-pipe	30	24 feet or 7 barrels	QR / 165ºF / Pendent	14.0	12 @ 18
	Dry-pipe			SR / 286ºF / Upright	16.8	24 @ 13
	Wet-pipe	30	1 barrel	Any / 165ºF / Any	11.2	30 @ 7
	Dry-pipe			SR / 286ºF / Upright	11.2	50 @ 7
	Wet-pipe	30	2 barrels	SR / 286ºF / Any	11.2	50 @ 29
Loading Aisle w/ Draft Curtain	Wet-pipe or Dry-pipe	30	NA	SR / 286ºF / Any	5.6	100 @ 13
					> 8.0	100 @ 7
Loading Aisle w/ Trench Drains or Banded Barrels or No Permanent Loading Aisle	Provide the barrel storage design across the entire roof area (i.e., storage area and loading aisle)					

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8.

Notes: QR = quick response sprinkler; SR = standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

4005.1.4.1 Protected product.
The storage and automatic sprinkler requirements in Table 4005.1.4 apply to alcohol-water mixtures greater than 20 percent and up to 75 percent alcohol by volume in wooden barrel sizes not exceeding 130 gallons (492 L).

4005.1.4.2 Hose stream allowance.
The automatic sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.1.4.3 Water supply duration.
The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.1.4.4 Automatic sprinkler system balancing.
Where a permanent loading aisle is provided with a separate automatic sprinkler system on the ceiling, the barrel storage automatic sprinkler design and the loading aisle automatic sprinkler design are not required to be balanced at the point of connection.

4005.1.4.5 Dry pipe sprinkler systems.
Where dry-pipe sprinkler systems are installed, the sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.1.4.6 Small distilled spirits facilities.
Fire protection for palletized storage of distilled spirits in small distilled spirits facilities not greater than 7,500 square feet (697 m²) is permitted to be in accordance with Sections 4005.1.4.6.1 through 4005.1.4.6.3.

4005.1.4.6.1 Ceiling clearance.
The clearance from the top of storage to the deflector of the automatic sprinklers at the ceiling shall be a minimum of 18 inches (457 mm) and a maximum of 10 feet (3048 mm).

4005.1.4.6.2 Automatic sprinkler coverage area.
The automatic sprinkler coverage area shall not exceed 80 square feet (7.4 m2) per sprinkler.

4005.1.4.6.3 Fire protection scheme.
The storage arrangement and automatic sprinkler system design shall be in accordance with Table 4005.1.4.6.3.

TABLE 4005.1.4.6.3 PALLETIZED STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS IN SMALL DISTILLED SPIRITS FACILITIES

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height (feet)	Ceiling Sprinkler Protection			
				Response / Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Sprinkler Density (gpm/ft^2)	Area (square feet)
Barrel Storage	Wet-pipe	24	12	SR / 286ºF / Any	≥ 11.2	0.35	4000
				SR / 165ºF / Any	≥ 11.2	0.35	7500

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: SR = standard response sprinkler.

4005.2 Rack storage in wooden barrels.
The rack storage of distilled spirits and wine greater than 20 percent alcohol shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 and Sections 4005.2.1 through 4005.2.3.5.2.

4005.2.1 Flues spaces for on-side wooden barrels.
Rack storage for on-side wooden barrels shall be provided with a minimum width of 8 inches (203 mm) between adjacent rows of barrels.

4005.2.1.1 Elevated walkways.
Where provided, elevated walkways between barrels shall be constructed in accordance with one of the following:

1. Noncombustible materials that are 50 percent open.
2. Noncombustible materials that are open less than 50 percent provided the walkway has a maximum width of 1 foot (0.3 m) and a minimum gap of 3 inches (76 mm) is provided between the walkway and the barrel storage.
3. Combustible materials and provided with a row of automatic sprinklers directly beneath each walkway.

4005.2.2 Flues spaces for on-end wooden barrels.
Rack storage arrangements with on-end wooden barrels shall be provided with transverse and longitudinal flue spaces with a minimum width of 6 inches (15 cm).

4005.2.3 Fire protection for rack storage.
Rack storage arrangements of alcohol-water mixtures up to 75 percent alcohol in wooden barrel with sizes not exceeding 130 gallons (492 L) shall be protected in accordance with Sections 4005.2.3.1 through 4005.2.3.5.2.

4005.2.3.1 Hose stream allowance.
The automatic sprinkler system design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.2.3.2 Water supply duration.
The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

4005.2.3.3 Dry-pipe automatic sprinkler system.
Where dry-pipe automatic sprinkler systems are installed, the automatic sprinkler system shall be designed to deliver water to the most remote 4 sprinklers within 40 seconds.

4005.2.3.4 Ceiling automatic sprinkler systems.
The automatic sprinkler systems installed at the ceiling shall be designed with a minimum density of 0.2 gallons per minute per square foot (0.8 L/min) with an operating area of 2,000 square feet (186 m2).

4005.2.3.5 Automatic sprinkler system balancing.
The automatic sprinkler system installed at the ceiling and the in-rack sprinkler system shall be balanced at the point of connection.

4005.2.3.6 Automatic sprinkler system design.
The design of the automatic sprinkler system at the ceiling and the in-rack sprinkler system shall be in accordance with Table 4005.2.3.6.

TABLE 4005.2.3.6 RACK STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS

Barrel Arrangement	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Minimum Aisle Width (feet)	Ceiling Sprinkler Protection			In-Rack Sprinkler Protection			
					Response / Nominal Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Design, # of Sprinklers @ Pressure (psi)	Layout	Response / Nominal Temperature Rating	K-factor (gpm/psi$^{1/2}$)	Design [a], # of Sprinklers @ Pressure (psi)
On-Side	Wet	40	33 feet / 9 barrels	NA	QR / 165°F / Pendent	14.0	12 @ 37	None			
					SR / 286°F / Any	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165°F / Any	8.0 (115)	6 @ 45 [one level of in racks] or 12 @ 45 [more than one level of in-racks]
	Dry	40	33 feet / 9 barrels	NA	SR / 286°F / Upright	16.8	24 @ 25	None			
					SR / 286°F / Upright	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165°F / Upright	8.0 (115)	6 @ 45 [one level of in racks] Or 12 @ 45 [more than one level of in-racks]
On-End	Wet	30	25 feet / 5 barrels	8	SR / 286°F / Any	≥ 11.2	50 @ 7	Figures 4005.2.3.6(3),	QR / 165°F / Any	≥ 8.0 (115)	6 @ 25 [one level]
								4005.2.3.6(4), 4005.2.3.6(5) and 4005.2.3.6(6)			or 12 @ 25 [more than one level of in-racks]

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

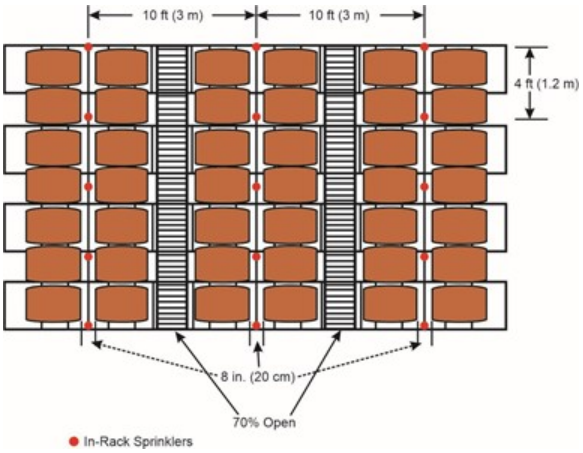


Figure 4005.2.3.6(1) In-rack sprinkler layout for wooden barrels on their sides (plan view)

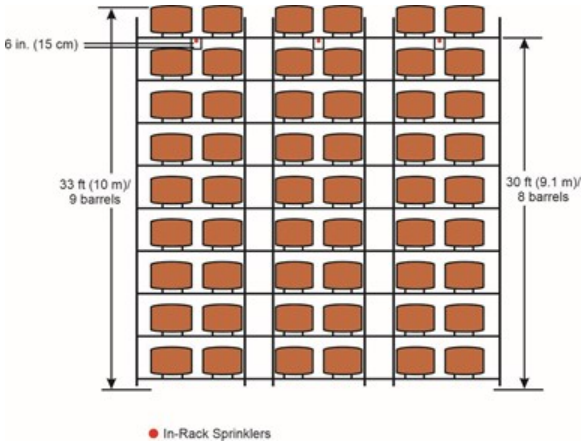


FIGURE 4005.2.3.6(2)
IN-RACK SPRINKLER LAYOUT FOR WOODEN BARRELS ON THEIR SIDES (ELEVATION VIEW)

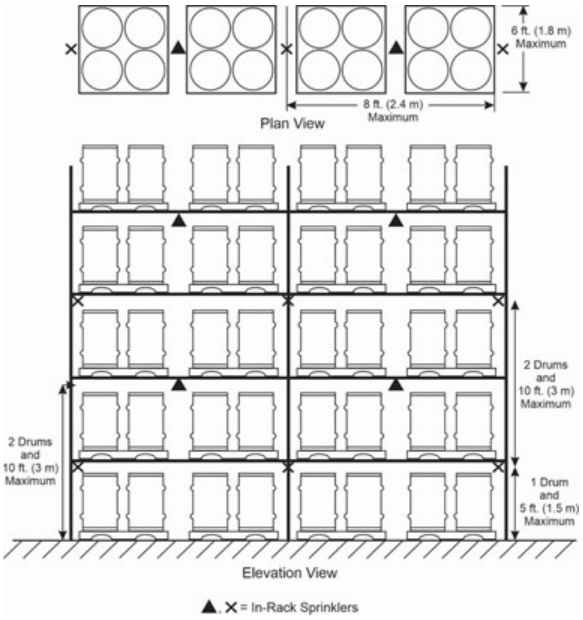


FIGURE 4005.2.3.6(3) IN-RACK SPRINKLER LAYOUT FOR SINGLE ROW RACK OF ON-END WOODEN BARRELS

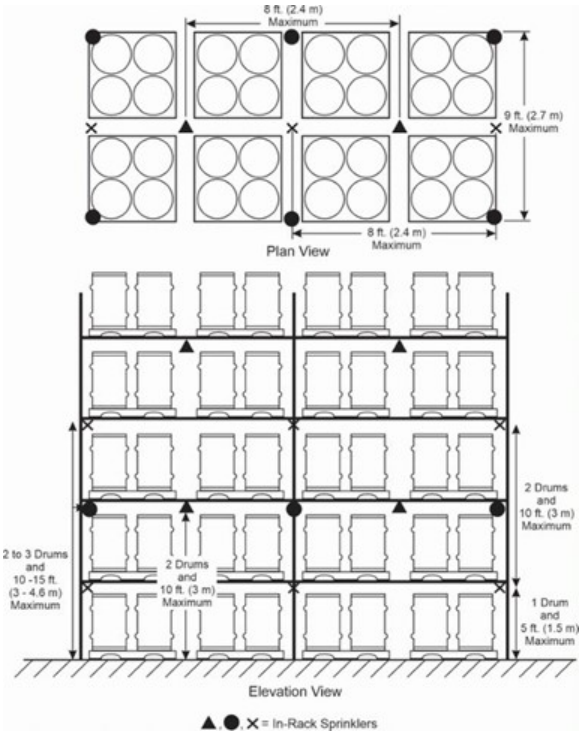


FIGURE 4005.2.3.6(4) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

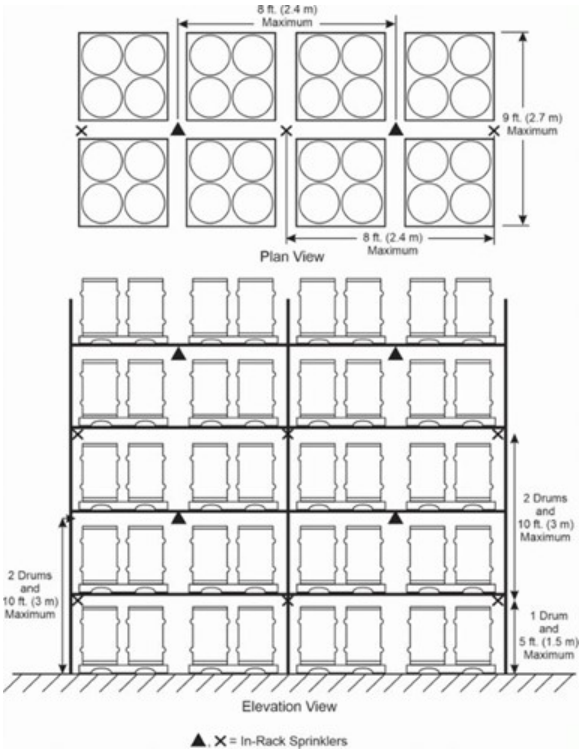


FIGURE 4005.2.3.6(5) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

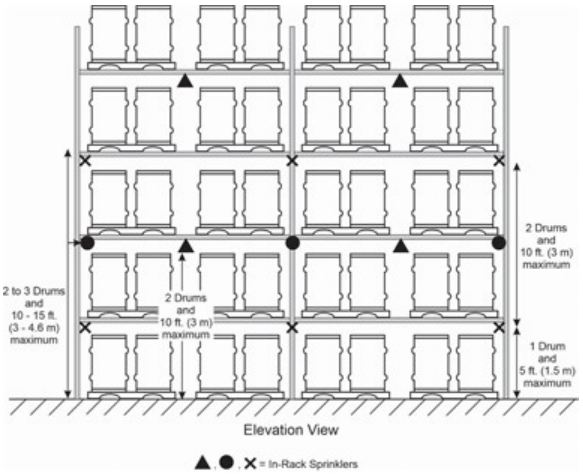


FIGURE 4005.2.3.6(6) IN-RACK SPRINKLER LAYOUT FOR MULTIPLE ROW RACK OF ON-END WOODEN BARRELS

4005.3 Wine 20 percent or less alcohol content.
The storage of wine in barrels with an alcohol content of 20 percent or less shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1.

Revise as follows:

~~4005.2~~ 4005.4 Portable fire extinguishers. *Approved* portable fire extinguishers shall be provided in accordance with Section 906.

Reason: This proposal provides guidance for storage and associated fire protection of alcoholic beverages both in warehouse and in small distillery facilities.
One of the conceptual changes is the threshold at which the percentage of alcohol results in a higher classification of hazard. Traditionally, beverages with an alcohol content greater than 16% were considered to present a higher level of hazard and were therefore placed into Group F-1 for manufacturing and packaging and Group S-1 for storage. Recent testing by FM Global demonstrates that the 16% threshold was too conservative and the threshold is being revised to 20%. Even recent revisions to Ch 32 list beverages in glass or ceramic containers with up to 20% alcohol content as a Class I commodity. The alcohol content does not raise the flammability of the liquid to an extent where additional levels of protection are necessary, and for the most part can be considered nonflammable or noncombustible. As a result, the manufacturing, packaging and storage of beverages with an alcohol content up to 20% will be classified as Group F-2 or S-2 as appropriate. This results in revisions to IBC Chapter 3 and the IFC occupancy definitions in Chapter 2.

The fire protection section provides specific sprinkler system design criteria. The requirements are based on the storage configuration:

- Palletized storage in Section 4005.1
- Rack storage in Section 4005.2

Palletized storage is then provided with design options in Section 4005.1.3:

- Provide draft curtains along the loading aisles
- Provide trench drains along each side of the loading aisles
- Provide straps to secure the barrels to the pallet
- There is a 4th option, which is to not provide a loading aisle at all. As stated in the charging sentence “palletized storage provided with a defined loading aisle...” In other words, the building or room is solid storage; it will have walkways to access the barrels but will not have a forklift loading aisle.

Each of these three designs provides a method of mitigating the spread of liquid or fire during a fire incident. These three protection features are again reference in Table 4005.1.4, and have an impact on the fire sprinkler system design.

The fire sprinkler design criteria is core of this code change. Table 4005.1.4 provides criteria for sprinkler system densities, storage heights and sprinkler selection. This design criteria is based on full-scale fire testing conducted by FM Global and presented in FM Data Sheet 7-29.

Section 4005.1.4 provides for a reduced level of sprinkler protection. Because of reduced level of protection, this section is limited to facilities no greater than 7,500 square feet and with a ceiling height of no more than 24 feet. The intent of this reduction is to allow the small distilleries with a reasonable level of protection based on the reduced fire load per square foot and limited size.

Rack storage is covered in Section 4005.2. This section contains specific requirements again based on storage method:

- Barrels stored on their side
- Barrels stored on-end

The difference in configuration results in different sprinkler design criteria in Table 4005.2.3.6. Rack storage is allowed up to 33 feet in height. Figures have been included to depict the in-rack sprinkler locations.

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

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

Bibliography: FM Global Property Loss Prevention Data Sheet 7-29, Ignitable Liquid Storage in Portable Containers, October 2020
Factory Mutual Insurance Company, Johnson, RI

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Chapter 40 of the Fire Code already requires an approved fire sprinkler system for new distilleries and storage facilities for distilled spirits. This code change does not increase that requirement but will provide guidance and consistency in how jurisdictions apply the fire sprinkler requirement.

F186-21 Part I

Public Hearing Results

This proposal includes published errata

https://cdn-web.iccsafe.org/wp-content/uploads/2021-GROUP-A-CONSOLIDATED-MONOGRAPH-UPDATES-Updated-4-02-2021-complete.pdf

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for approval was that the basis of this new prescriptive code section is data. As noted, it is not a one size fits all issue. The section addresses both the small and large distilleries and more importantly, the different configurations of storage based on the full-scale fire test data. Additionally, since there is a lot of these distilleries, it is necessary to make sure that they have a reasonable type of sprinkler system to provide appropriate mitigation for the hazards that are known to be possible with alcoholic beverages, which are now up to 20%. (Vote: 12-2)

F186-21 Part I

Individual Consideration Agenda

Public Comment 1:

IFC: 4005.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

4005.1 Palletized storage of distilled spirits in wooden barrels . The palletized storage of distilled spirits in wooden barrels shall be protected by an *approved automatic sprinkler system* installed throughout the building in accordance with Section 903.3.1.1 as modified in this section. The palletized storage of metal containers of distilled spirits shall be protected by an *approved automatic sprinkler system that complies with* Chapter 57.

Commenter's Reason: This public comment clarifies that the specific storage heights and associated sprinkler densities are addressed in Chapter 57 for metal containers. The provisions found with Section 4005.1.4 are based upon testing with wooden barrels.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This simply clarifies the applicability of the automatic sprinkler system requirements based upon type of container.

Public Comment# 2325

Public Comment 2:

IFC: TABLE 4005.2.3.6, FIGURE 4005.2.3.6(4), FIGURE 4005.2.3.6(5), FIGURE 4005.2.3.6(6), 4005.2.3.6(5) (New)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

TABLE 4005.2.3.6 RACK STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS

Portions of table not shown remain unchanged.

Barrel Arrangement	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Minimum Aisle Width (feet)	Ceiling Sprinkler Protection			In-Rack Sprinkler Protection			
					Response / Nominal Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Design, # of Sprinklers @ Pressure (psi)	Layout	Response / Nominal Temperature Rating	K-factor (gpm/psi$^{1/2}$)	Design [a], # of Sprinklers @ Pressure (psi)
On-End	Wet	30	25 feet / 5 barrels	8	SR / 286°F / Any	≥ 11.2	50 @ 7	Figures 4005.2.3.6(3), 4005.2.3.6(4) and, 4005.2.3.6(5) ~~and 4005.2.3.6(6)~~	QR / 165°F / Any	≥ 8.0 (115)	6 @ 25 [one level] or 12 @ 25 [more than one level of in-racks]

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

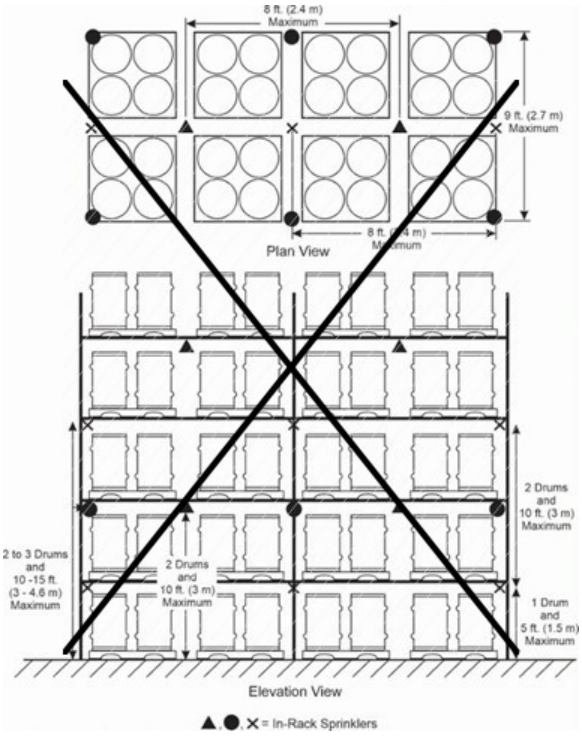
Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi0.5 = 14.395 L/min/bar0.5; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).



~~**FIGURE 4005.2.3.6(4) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS**~~

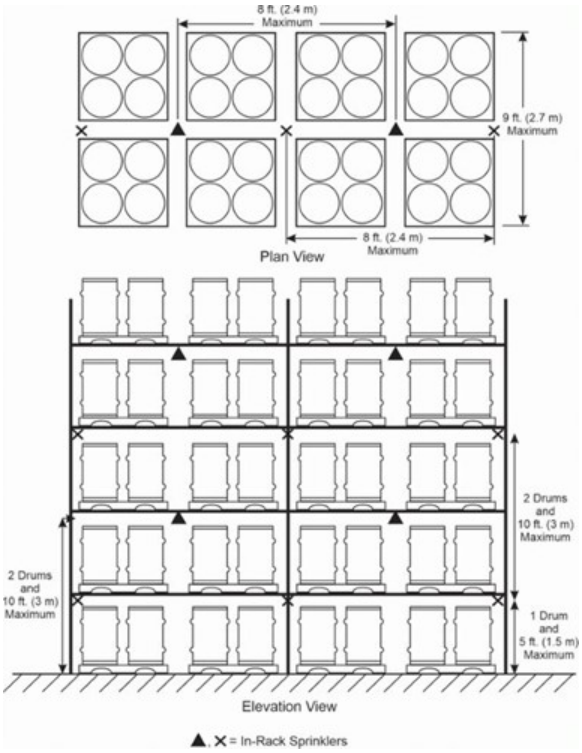


FIGURE ~~4005.2.3.6(5)~~ 4005.2.3.6(4) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

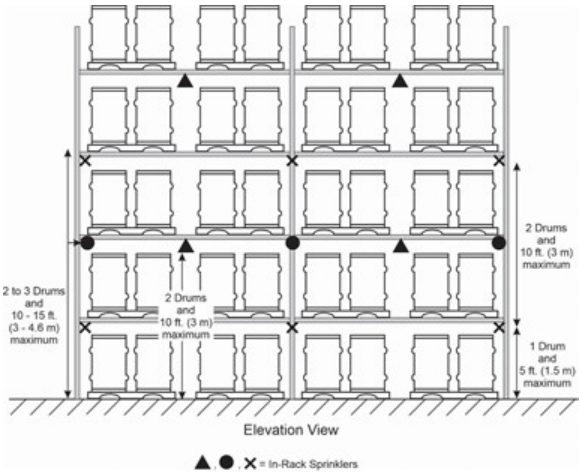
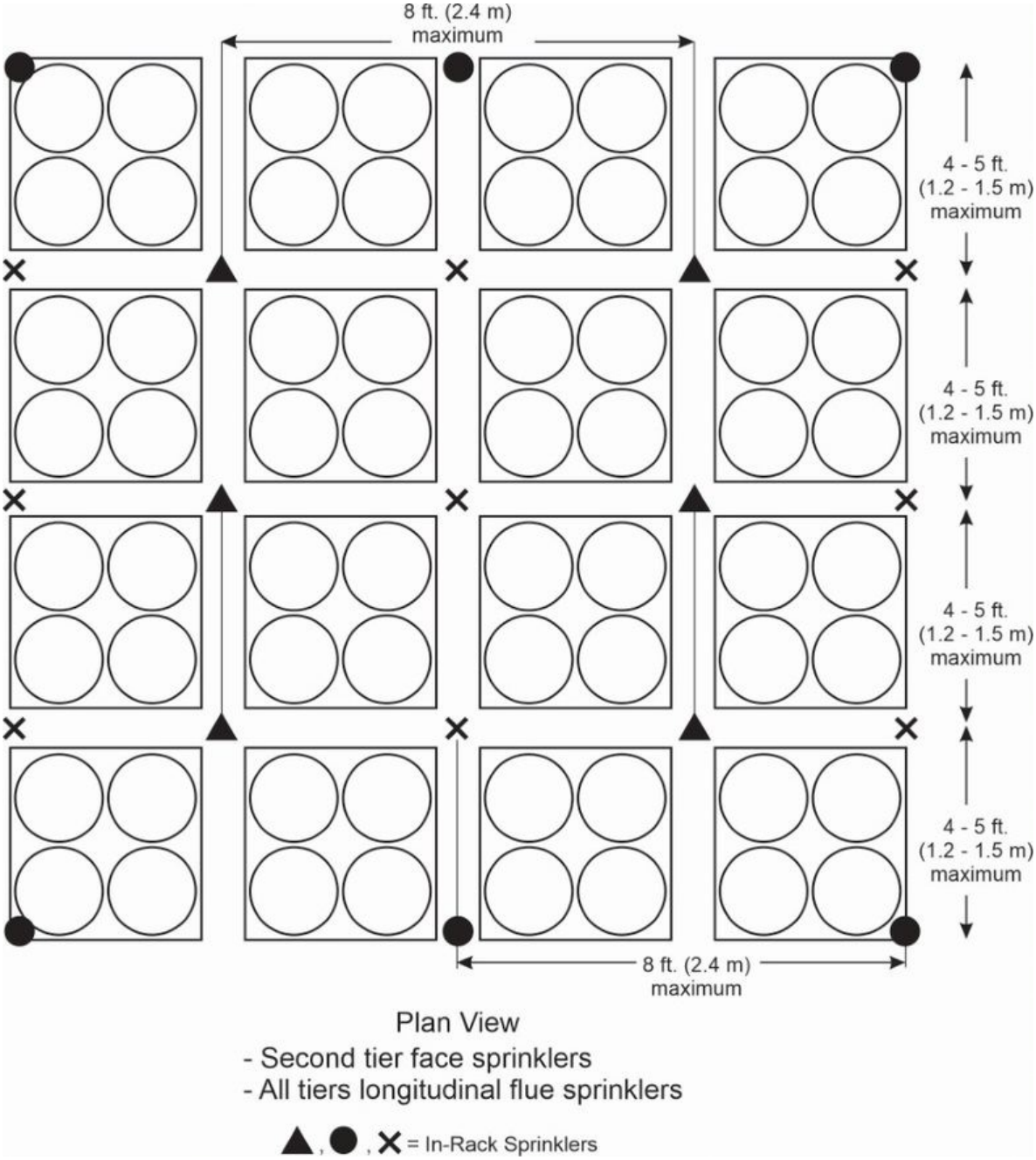


FIGURE ~~4005.2.3.6(6)~~ 4006.5.3.6(5) IN-RACK SPRINKLER LAYOUT FOR MULTIPLE ROW RACK OF ON-END WOODEN BARRELS



4005.2.3.6(5) IN-RACK SPRINKLER LAYOUT FOR MULTIPLE ROW RACK OF ON-END WOODEN BARRELS

Commenter's Reason: The purpose of this PC is simply editorial. First it removes an unnecessary Figure from the table and the proposal. Additionally, the plan view of what is now numbered as Figure 4005.2.3.6(5) was omitted in the original proposal and has been added by this PC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction Provides an editorial fix to correct figures. The cost impact is unchanged from the original proposal.

Public Comment# 2326

Public Comment 3:

Proponents: Jeffrey Hugo, representing NFSA (hugo@nfsa.org) requests Disapprove

Commenter's Reason: The design criteria contained in this proposal is not ready for the IFC. It comes from FM Data Sheet 7-29 and the Distilled Spirits Council of the United States (DISCUS) *Recommended Fire Protection Practices for Distilled Spirits Beverage Facilities*. Both documents are

developed for clients, not by consensus This means the development of both above documents are not ANSI-based; open to the public for input, the ability for the public to comment, decided upon by a balanced committee, or voted upon by a membership.
By disapproving this change, the current Section 4005.1 (2021 edition) would remain and continue to require automatic sprinkler systems using Chapter 9. NFPA 13 (903.3.1.1) is the correct installation standard for Chapter 40, wherein it would reference to NFPA 30, the appropriate place for the design criteria for distilled spirits. NFPA standards, used extensively by the ICC, are ANSI-based open consensus-based standards that this information, such as the test reports, modeling, and data are evaluated and reviewed by fire protection experts in a full development cycle.

Public Inputs based on FM 7-29 are submitted in the 2024 NFPA 30 cycle and if approved could be referenced in the next or 2027 edition of the IFC, While there is a need for design criteria for these types of facilities, it is prudent to wait for NFPA 30 to complete its consensus-based process.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2867

F186-21 Part II

Proposed Change as Submitted

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

2021 International Building Code

SECTION 306
FACTORY GROUP F

Revise as follows:

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

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over ~~16 percent~~ 20 percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers

- Upholstering
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

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

- Beverages: up to and including ~~16 percent~~ 20 percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

SECTION 311
STORAGE GROUP S

Revise as follows:

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

- *Aerosol products*, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over ~~16 percent~~ 20 percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* specified in Table 307.1(1) (see Section 406.8)
- Photo engravings
- Resilient flooring
- *Self-service storage facility* (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are

permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including ~~16 percent~~ 20 percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Reason: This proposal provides guidance for storage and associated fire protection of alcoholic beverages both in warehouse and in small distillery facilities.

One of the conceptual changes is the threshold at which the percentage of alcohol results in a higher classification of hazard. Traditionally, beverages with an alcohol content greater than 16% were considered to present a higher level of hazard and were therefore placed into Group F-1 for manufacturing and packaging and Group S-1 for storage. Recent testing by FM Global demonstrates that the 16% threshold was too conservative and the threshold is being revised to 20%. Even recent revisions to Ch 32 list beverages in glass or ceramic containers with up to 20% alcohol content as a Class I commodity. The alcohol content does not raise the flammability of the liquid to an extent where additional levels of protection are necessary, and for the most part can be considered nonflammable or noncombustible. As a result, the manufacturing, packaging and storage of beverages with an alcohol content up to 20% will be classified as Group F-2 or S-2 as appropriate. This results in revisions to IBC Chapter 3 and the IFC occupancy definitions in Chapter 2.

The fire protection section provides specific sprinkler system design criteria. The requirements are based on the storage configuration:

- Palletized storage in Section 4005.1
- Rack storage in Section 4005.2

Palletized storage is then provided with design options in Section 4005.1.3:

- Provide draft curtains along the loading aisles
- Provide trench drains along each side of the loading aisles
- Provide straps to secure the barrels to the pallet
- There is a 4th option, which is to not provide a loading aisle at all. As stated in the charging sentence “palletized storage provided with a defined loading aisle...” In other words, the building or room is solid storage; it will have walkways to access the barrels but will not have a forklift loading aisle.

Each of these three designs provides a method of mitigating the spread of liquid or fire during a fire incident. These three protection features are again reference in Table 4005.1.4, and have an impact on the fire sprinkler system design.

The fire sprinkler design criteria is core of this code change. Table 4005.1.4 provides criteria for sprinkler system densities, storage heights and

sprinkler selection. This design criteria is based on full-scale fire testing conducted by FM Global and presented in FM Data Sheet 7-29.

Section 4005.1.4 provides for a reduced level of sprinkler protection. Because of reduced level of protection, this section is limited to facilities no greater than 7,500 square feet and with a ceiling height of no more than 24 feet. The intent of this reduction is to allow the small distilleries with a reasonable level of protection based on the reduced fire load per square foot and limited size.

Rack storage is covered in Section 4005.2. This section contains specific requirements again based on storage method:

- Barrels stored on their side
- Barrels stored on-end

The difference in configuration results in different sprinkler design criteria in Table 4005.2.3.6. Rack storage is allowed up to 33 feet in height. Figures have been included to depict the in-rack sprinkler locations.

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

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

Bibliography: FM Global Property Loss Prevention Data Sheet 7-29, Ignitable Liquid Storage in Portable Containers, October 2020
Factory Mutual Insurance Company, Johnson, RI

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Chapter 40 of the Fire Code already requires an approved fire sprinkler system for new distilleries and storage facilities for distilled spirits. This code change does not increase that requirement but will provide guidance and consistency in how jurisdictions apply the fire sprinkler requirement.

F186-21 Part II

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This proposal was approved for S-1 and F-1 occupancies and the alcohol content of beverages as providing consistency with other provisions in the IBC and IFC, including IFC Table 3203.8. (Vote: 14-0)

F186-21 Part II

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 306, 306.2, 306.3, SECTION 311, 311.2, 311.3

Proponents: Brad Emerick, representing Myself requests As Modified by Public Comment

Modify as follows:

SECTION 306
FACTORY GROUP F

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

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over ~~20~~ 17.7 percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated use buildings
- Engines (including rebuilding)
- Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Water/sewer treatment facilities
- Wood; distillation
- Woodworking (cabinet)

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

- Beverages: up to and including ~~20~~ 17.7 percent alcohol content
- *Brick* and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

SECTION 311
STORAGE GROUP S

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 ~~20~~ 17.7 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

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

- Asbestos
- Beverages up to and including ~~20~~ 17.7 percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors

- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- *Gypsum board*
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and *trim*
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Public parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Commenter's Reason: This proposed modification is simply to accurately correlate the threshold between *Moderate-* and *Low-Hazard Occupancies* that produce, handle and store alcohol beverages with the definitions of *Flammable* and *Combustible Liquids*.
Facilities that produce, handle and store alcohol beverages (less than the Maximum Allowable Quantities or MAQs) are classified as **Moderate-Hazard** (e.g., distilleries) and **Low-Hazard** (e.g., breweries and wineries).

The definitions of ***Flammable*** *Liquids* and ***Combustible*** *Liquids* are international standards. DOT, TTB, ICC, OSHA, NFPA, etc., etc., all recognize the definition of ***Flammable Liquid*** as "A liquid having a Closed Cup Flash Point **below 100°F (38°C)**" and the definition of "***Combustible Liquid*** as "A liquid having a Closed Cup Flash Point **at or above 100°F (38°C)**" in their codes and standards.

The concentration of alcohol in an alcohol beverage with a Closed Cup Flash Point of **100°F** is 17.74%.

The table below lists concentrations of alcohol in water from 0% to 100% and the corresponding Closed Cup Flash Point temperatures.

Alcohol by Volume (ABV)	Closed Cup Flash Point	Reference
0%		
5%	144 °F	(1)
10%	120 °F	(1)
17.7%	100 °F	(3)
20%	97 °F	(1)
30%	85 °F	(1)
40%	79 °F	(1)
50%	75 °F	(1)
60%	72 °F	(1)
70%	70 °F	(1)
80%	68 °F	(1)
90%	65 °F	(1)
95%	63 °F	(1)
100%	55 °F	(2)

Bibliography: Reference

(1) Fire Protection Guide to Hazardous Materials 14ed; NFPA

(2) An Introduction to Fire Dynamics 2ed; Drysdale

(3) 6^{th} Order Polynomial Regression with R^2=0.9994

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction Increasing the previous threshold of 16% to 17.7% allows more wineries and breweries to be classified to a lower-hazard threshold.

Public Comment# 2737

F204-21

Proposed Change as Submitted

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)

2021 International Fire Code

Revise as follows:

5704.2.13.1.4 Tanks abandoned in place. Tanks abandoned in place shall be as follows:

1. ~~*Flammable* and *combustible liquids* shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, and purged of all vapor. The contents of the storage tank and related piping shall be removed from the premises or property and disposed of in accordance with applicable local, state, or federal rules and regulations.
2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected and either be permanently removed, capped, plugged, or filled with concrete.
3. Underground tanks shall be filled completely with an *approved* inert solid material. Above-ground tanks may either be filled with an approved inert solid material or if not filled with an *approved* inert solid material then the vent line shall remain open and intact.
   ~~The tank shall be filled completely with an *approved* inert solid material.~~
4. Remaining underground piping shall be capped or plugged.

   Exception: Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where approved by the fire code official.
5. A record of tank size, location and date of abandonment shall be retained.
6. All exterior above-grade fill piping shall be permanently removed when tanks are abandoned or removed, or the oil fill pipe shall be filled with concrete.
7. Tanks with automatic delivery shall have the supplier or suppliers notified in writing a minimum of 24 hours prior to the abandonment, instructing them to discontinue deliveries.

5704.2.14 Removal and disposal of tanks. Removal and disposal of tanks shall comply with Sections 5704.2.14.1 and 5704.2.14.2.

Revise as follows:

5704.2.14.1 Removal. Removal of above-ground and underground tanks shall be in accordance with all of the following:

1. ~~*Flammable* and *combustible liquids* shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, purged of all vapor, and inerted.
2. Piping at tank openings that is not to be used further shall be disconnected.
3. Piping shall be removed from the ground.

   ~~**Exception**~~ **Exceptions:**

   1. Piping is allowed to be abandoned in place where the *fire code official* determines that removal is not practical. Abandoned piping shall be capped and safeguarded as required by the *fire code official*.
   2. Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where *approved* by the *fire code official*.
4. Tank openings shall be capped or plugged, leaving a $^1/_8$-inch to $^1/_4$-inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.
5. Tanks shall be purged of vapor and inerted prior to removal.
6. All exterior above-grade fill and vent piping shall either be permanently removed or filled with concrete.

   Exception: Piping associated with bulk plants, terminal facilities and refineries.
7. Tanks with automatic delivery shall have the supplier or suppliers notified in writing a minimum of 24 hours prior to the removal, instructing them to discontinue deliveries.

5704.2.14.2 Disposal. ~~Tanks shall be disposed of in accordance with federal, state and local regulations.~~ The tank and related piping, and the contents of the tank and related piping shall be removed from the premises and disposed of in accordance with applicable local, state, or federal rules and regulations

Reason: This change provides some additional clarity on proper removal and disposal of the materials within tanks that are abandoned in place and those removed and disposed of. It is also attempting to clarify scenarios where either reuse of existing piping is necessary for replacement tank installations, or for when removal of all piping would be unnecessarily onerous. Lastly, it requires property owner notification to supplies when the tank is abandoned or removed. This was done to help minimize the chances of a supplier attempting to fill a tank that has been abandoned or removed, resulting in a spill and costly remediation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These changes provide some more flexibility in the abandonment and removal of tanks while clarifying what would already be required by local, state, and federal laws. The only potential small cost, which is not a construction cost, would be the cost to the property owner to notify the suppliers. Depending on the method of notification (electronic such as email, or a mailed letter), the cost would be marginal.

F204-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as the details are not complete with the proposal such as how a fill pipe is addressed to avoid accidental filling. It allows the fill pipe to remain in place if filled with concrete. Also, it was pointed out that as written the contents of the tank need to be cleaned versus the tank itself. (Vote 13-0)

F204-21

Individual Consideration Agenda

Public Comment 1:

IFC: 5704.2.13.1.4, 5704.2.14.1

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) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

5704.2.13.1.4 Tanks abandoned in place . Tanks abandoned in place shall be as follows:

1. The entire contents of the tank and related piping shall be emptied, ~~cleaned,~~ and the tank purged of all vapor. The contents of the storage tank and related piping shall be removed from the premises or property and disposed of in accordance with applicable local, state, or federal rules and regulations.
2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected and either be permanently removed, capped, plugged, or filled ~~with concrete.~~ completely with an *approved* inert solid material.
3. ~~Underground tanks~~ Tanks shall be filled completely with an *approved* inert solid material. ~~Above-ground tanks may either be filled with an approved inert solid material or if not filled with an *approved* inert solid material then the vent line shall remain open and intact.~~
4. Remaining underground piping shall be capped or plugged.

   Exception: Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where approved by the fire code official.
5. A record of tank size, location and date of abandonment shall be retained.
6. All exterior above-grade fill piping shall be permanently removed when tanks are abandoned or removed, or the oil fill pipe shall be filled ~~with concrete~~ completely with an *approved* inert solid material.
7. ~~Tanks~~ owner of tanks with automatic delivery shall notify ~~have~~ the supplier or suppliers ~~notified~~ in writing a minimum of 24 hours prior to the

abandonment, instructing them to discontinue deliveries.

5704.2.14.1 Removal . Removal of above-ground and underground tanks shall be in accordance with all of the following:

1. The entire contents of the tank and related piping shall be emptied, ~~cleaned,~~ the tank and piping purged of all vapor, and inerted.
2. Piping at tank openings that is not to be used further shall be disconnected.
3. Piping shall be removed from the ground.

   Exceptions:

   1. Piping is allowed to be abandoned in place where the *fire code official* determines that removal is not practical. Abandoned piping shall be capped and safeguarded as required by the *fire code official*.
   2. Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where *approved* by the *fire code official*.

4. Tank openings shall be capped or plugged, leaving a $^1/_8$-inch to $^1/_4$-inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.
5. Tanks shall be purged of vapor and inerted prior to removal.
6. All exterior above-grade fill and vent piping shall either be permanently removed or filled ~~with~~ with an approved inert solid material.

   ~~concrete.~~

   Exception: Piping associated with bulk plants, terminal facilities and refineries.

7. The owner of tanks ~~Tanks~~ with automatic delivery shall notify~~have~~ the supplier or suppliers ~~notified~~ in writing a minimum of 24 hours prior to the removal, instructing them to discontinue deliveries.

Commenter's Reason:
The additional modifications were made to:
1) The additional modifications increase clarity.
2) Eliminates the requirement for the tank to be cleaned, as
   a. There is no practical method to clean a tank.
   b. A clean tank will provide a minimal environmental benefit as most of the residual material will become bound with the fill material.
   c. Cleaning the tank will increase the amount of hazardous waste
   d. A clean tank may be subjective as there is no standard to define when a tank is clean.
   e. Cleaning a tank may require a person to enter the tank which is a dangerous activity.
3) Allows the pipe and tank to be filled with other materials besides just concrete such as foam, grout, or other acceptable material.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
These changes provide some more flexibility in the abandonment and removal of tanks while clarifying what would already be required by local, state, and federal laws. The only potential small cost, which is not a construction cost, would be the cost to the property owner to notify the suppliers. Depending on the method of notification (electronic such as email, or a mailed letter), the cost would be marginal.

Public Comment# 2571

F205-21

Proposed Change as Submitted

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2021 International Fire Code

Revise as follows:

5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. ~~The d~~ Dispensers shall not be ~~installed~~ located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be ~~mounted~~ located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.
5. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.
6. ~~5.~~ Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated “touch free” alcohol-based hand-rub dispensing devices with the following requirements:

    ~~5.1~~ 6.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer’s care and use instructions.

    ~~5.2~~ 6.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

        ~~5.2.1~~ 6.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.

        ~~5.2.2~~ 6.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).

        ~~5.2.3~~ 6.2.3. An object placed within the activation zone and left in place will cause only one activation.

7. ~~6.~~ Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.
8. ~~7.~~ Dispensers installed in occupancies with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.1 Corridor installations. In addition to the provisions of Section 5705.5, where ~~wall-mounted~~ dispensers containing alcohol-based hand rubs are ~~installed~~ located in *corridors* or rooms and areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.
4. The minimum *corridor* width shall be 72 inches (1829 mm).
5. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

Reason: Pandemics such as the Covid-19 virus have led to an increased need to provide hand sanitizer dispensers. This proposal removes the term "wall-mounted" in the scope of this section in order to cover all dispensers, including wall mounted and floor supported dispensers. It is not intended to apply to individual personal use hand sanitizers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
It introduces an option for floor supported hand sanitizers to be used.

F205-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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, 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 flammable 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.

5705.5.1 Corridor installations. In addition to the provisions of Section 5705.5, where dispensers containing alcohol-based hand rubs are located in *corridors* or rooms and areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).

3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.

~~4. The minimum *corridor* width shall be 72 inches (1829 mm).~~

~~5.~~ 4. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

Committee Reason: This proposal was approved as it provides the most enforceable language than found in the other proposals. Means of egress concerns are addressed. This proposal also better deals with practical issues such as ignition sources and controls how the dispensers operate. A key element is removing the limitation of enforcing only for wall mounted dispensers. This provides the basic tools for enforcement of all dispenser types. It is encouraged that all F190-21, F205-21, F206-21 and F207-21 be reviewed together and to come back with a coordinated public comment to address additional concerns with issues such as corridor width and enforcement. The modifications remove an additional occurrence of "wall-mounted" that was missed and removes the corridor width limitation that is not appropriate beyond healthcare facilities. (Vote: 9-4)

F205-21

Individual Consideration Agenda

Public Comment 1:

IFC: 5705.5

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

5705.5 Alcohol-based hand rubs classified as Class I or II liquids . The use of dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. Dispensers shall not be located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.
5. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.
6. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated “touch free” alcohol-based hand-rub dispensing devices with the following requirements:

   6.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer’s care and use instructions.

   6.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

      6.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.

      6.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).

      6.2.3. An object placed within the activation zone and left in place will cause only one activation.

7. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.

~~8. Dispensers installed in occupancies with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Commenter's Reason: This Public Comment is submitted by the ICC Fire Code Action Committee (FCAC) and the Committee on Health Care (CHC).

Removes the requirement for the use of dispensers in carpeted occupancies to only be permitted where the smoke compartment of fire area is protected with a NFPA 13 or NFPA 13R automatic fire sprinkler system. Carpets in buildings are regulated by the IFC have interior finish requirements for floor carpeting. There has been no documented data showing a higher fire risk for dispensers in carpeted areas or buildings when compared to non-carpeted areas.

It is the intention of this Public Comment to delete Item 8 in Section 5705.5 that addresses requirements for Dispensers installed in areas containing carpeted floors. This Item is also addressed by a separate Public Comment that would modify the current requirements for Dispensers in areas with carpeted floors. If the ICC membership approves this Public Comment, the intention would be to delete all specific requirements pertaining to Dispensers in areas with carpeted floors (Item 8 from Section 5705.5) as this item is not necessary.

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

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 and 2021 the CHC held several virtual meetings, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at:

https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/icc-committee-on-healthcare/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It introduces an option for hand sanitizers to be used.

Public Comment# 2237

Public Comment 2:

IFC: 5001.1, 5705.5, 5705.5.1, 5705.5.2 (New), TABLE 5705.5.2 (New), TABLE 5003.1.1(1); IBC: TABLE 307.1(1)

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org); John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

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, 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 installation and use of dispensers containing alcohol-based hand rubs , replacement alcohol-based hand rub solution and dispensers in storage classified as Class I or II liquids where in accordance with Section 5705.5.

12. Alcohol-based hand rub dispensers in use by individuals and containing not more than 16 oz (474 ml).

~~12.~~ 13. Specific provisions for flammble liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.

~~13.~~ 14. 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.~~ 15. Storage and display of aerosol products complying with Chapter 51.

~~15.~~ 16. 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.~~ 17. *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.~~ 18. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

5705.5 Alcohol-based hand rubs classified as Class I or II liquids . The use of dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each wall mounted dispenser shall be 68 ounces (2 ~~L).~~ L) and any other dispenser shall be 1 gallon (4 L) .

2. The maximum quantity within a control area shall be 30 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 Kg) of Level 1 aerosols, or a combination of Class 1 or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 30 gallons (37.85 L) or 1135 ounces (32.2 Kg). The combination of liquids and aerosols shall be limited such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.

~~2~~ 3 . The minimum separation between dispensers shall be 48 inches (1219 mm).

~~3.~~ 4. Dispensers shall not be located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance~~,~~ or device ~~or other ignition source.~~ The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.

~~4.~~ 5. Wall-mounted Dispensers shall be located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.

~~5.~~ 6. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.

~~6.~~ 7. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated “touch free” alcohol-based hand-rub dispensing devices with the following requirements:

~~6.1.~~ 7.1 The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer’s care and use instructions.

~~6.2.~~ 7.2 Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

~~6.2.1.~~ 7.2.1 Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.

~~6.2.2.~~ 7.2.2 The dispenser shall not dispense more than the amount required for hand hygiene consistent with label

instructions as regulated by the United States Food and Drug Administration (USFDA).

~~6.2.3.~~ ~~6.2.3~~ . 7.2.3

An object placed within the activation zone and left in place will cause only one activation.

~~7.~~ 8. Storage ~~and use~~ of alcohol-based hand ~~rubs~~ rub~~s~~ solution not in useshall be in accordance with the ~~applicable~~ provisions of ~~Sections~~ Section~~s 5704 and 5705.~~ 5705 5.2 .

~~8.~~ 9. Dispensers ~~installed~~ locatedin ~~occupancieswith~~ areas with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.1 Corridor installations . In addition to the provisions of Section 5705.5, where dispensers containing alcohol-based hand rubs are located in *corridors* or ~~rooms and~~ areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each ~~Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each~~ Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. ~~The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.~~

~~4.~~ 3 Projections into a *corridor* shall be in accordance with Section 1003.3.3.

5705.5.2 Storage of alcohol;-based hand rub solutions classified as Class 1 or Class II liquids. . The indoor storage of alcohol-based hand rub solution in liquid or gel form, classified as Class I or Class II liquids, shall be in accordance with all of the following:

1. The maximum quantity of individual alcohol-based hand rub solution storage container shall be 1 gallon (4 L) or less and the container shall be constructed of a material compatible with the alcohol-based solution.
2. Storage of alcohol-based hand rub solution in basements or below grade shall be in basements protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. Storage of alcohol-based hand rub solution shall be less than or equal to the amounts in Table 5705.5.2.

TABLE 5705.5.2 ALLOWABLE QUANTITY OF ALCOHOL_BASED HAND RUB SOLUTION IN STORAGE

STORAGE LOCATIONS	SPRINKLERED (gal)[d,f]	NONSPRINKLERED (gal) [e]
Open storage areas[c]	120	5
Non-dedicated storage room[a]	240	120
Non-dedicated storage room; 1-HR fire separation [a,g]	360	240
Non-dedicated storage room; 2-HR fire separation[a,g]	480	360
Dedicated storage room[b]	360	240
Dedicated storage room; 1-HR fire separation[b,g]	600	360
Dedicated storage room; 2-HR fire separation[b,g]	720	480

NP = Not permitted

a. Non-dedicated storage room is an enclosed storage area complying with the applicable storage requirements of this code.

b. Dedicated storage room is an enclosed storage area complying with the applicable storage requirements of this code used only for the storage of alcohol-based hand rub solution.

c. The number of open storage areas is limited to 1 per story or fire area with a maximum of four per building.

d. The number of non-dedicated storage rooms is limited to 2 per story, the number of dedicated storage rooms is limited to 4 per story.

e. The number of non-dedicated storage rooms is limited to 1 per story, the number of dedicated storage rooms is limited to 2 per story.

f. Automatic sprinkler design density for a minimum of Ordinary Hazard Group 2

g. Fire separation with a fire wall, fire barrier or fire partition and a fire resistance-rated horizontal barrier.

TABLE 5003.1.1(1) MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

Portions of table not shown remain unchanged.

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.

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.~~
6. Alcohol-based hand rub solutions classified as Class I or II liquids in storage in accordance with Section 5705.5.2

2021 International Building Code

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

Portions of table not shown remain unchanged.

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.~~
6. Alcohol-based hand rub solutions classified as Class I or II liquids in storage in accordance with Section 5705.5.2 of the International Fire Code.

Commenter's Reason: This Public Comment is submitted by the ICC Fire Code Action Committee (FCAC) and the Committee on Health Care (CHC).

1. The addition of “storage” in Exception 11 of Section 5001.1 (Scope) is consistent with the IFC Committee Action on proposal F190-21; This modification simply ensures that the intention of the exception is for both the alcohol-based hand rub dispensers and the storage of alcohol-based sanitizer solutions awaiting use.2. This Public Comments add an exception from IFC requirements for personal use hand sanitizer in quantities of 16 oz or less. It is not the intention of this section to impose any requirements on individual use hand sanitizers carried for personal sanitizing.

3. The higher quantity of allowable alcohol-based hand rub solution in dispensers is increased from 10 Gallons to 30 Gallons per control area. This is a reasonable increase in MAQ and is supported by the increased quantities that have been safely utilized in all public buildings during the pandemic.

4. Provides “clean-up” of requirements to differentiate permanent wall-mounted dispenser requirements which have been in the IFC for many cycles from other types of dispensers such as floor-supported, desktop or counter located that are currently being used.

5. Eliminating the additional quantity restrictions for dispensers used in corridors as unnecessary and overly restrictive

6. Adding a new Section (5705.5.2) for storage requirements and quantity limitations.

This new section adds reasonable storage quantities limits and requirements based on experience over the past 1 ½ years of the pandemic.

The proposal addresses storage of alcohol-based sanitizer solutions in a maximum individual container size of 1 gallon; provides maximum storage qualities for sprinklered and nonsprinklered buildings and incorporates allowances for higher storage quantities based on whether the storage room is for only alcohol-based sanitizer solutions and whether the storage room has 1 or 2 hour fire resistance rated construction for compartmentation of the hazard.

The current MAQs for Class IB flammable liquids (typical classification for an alcohol-based hand sanitizer solution) is 120 gallons with 100% increase for sprinklers and approved storage cabinets) . The quantities in Table 5705.5.2 are modeled after these MAQ allowances recognizing: the storage challenges created during the pandemic and the experience of storage inn these amounts without unreasonable fire risk or notable fire incidents; the benefit of fire sprinkler protection and fire separations for hazard mitigation for sanitizer solution in storage.

7. To correct Footnote “p” in the IBC and IFC MAQ table.

It is the intention of this Public Comment to modify Item 7 in Section 5705.5 that addresses requirements for Dispensers installed in areas containing carpeted floors. This Item is also addressed by a separate Public Comment that would completely remove any requirements for Dispensers in areas with carpeted floors. If the ICC membership approves the separate Public Comment, the intention would be to delete Item 7 from Section 5705.5.

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

documentation and reports are posted on the FCAC website at:

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

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 and 2021 the CHC held several virtual meetings, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at:

https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/icc-committee-on-healthcare/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
It introduces an option for hand sanitizers to be used and stored within buildings.

Public Comment# 2512

Public Comment 3:

IFC: 5705.5, 5705.5.1

Proponents: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

5705.5 Alcohol-based hand rubs classified as Class I or II liquids . The use of dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. Dispensers shall not be located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be ~~located~~ located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.
5. Dispensers shall be located a minimum of 6 feet (1829 mm) apart.

~~5.~~ 6. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.

~~6.~~ 7. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated “touch free” alcohol-based hand-rub dispensing devices with the following requirements:

~~6.1.~~ 7.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer’s care and use instructions.

~~6.2.~~ 7.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

~~6.2.1.~~ 7.2.1 Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing

device.

~~6.2.2.~~ 7.2.2 The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).

~~6.2.3.~~ 7.2.3 An object placed within the activation zone and left in place will cause only one activation.

~~7.~~ 8. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.

~~8.~~ 9. Dispensers installed in occupancies with carpeted floors shall only be allowed in *smoke compartments* or *fire areas* equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.1 Corridor installations . In addition to the provisions of Section 5705.5, where dispensers containing alcohol-based hand rubs are located in *corridors* or rooms and areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one. ~~4.~~
4. Dispensers shall be located a minimum of 6 feet (1829 mm) apart.

~~4.~~ 5. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

Commenter's Reason: This Public Comment inserts a requirement for separation of ABHR dispensers.
Section 5705.5.1 Item 4 was deleted by the committee based on the reason that 72" wide corridors are only required in health care. While this statement is true, the 72" wide corridor actually went into the code based on fire modeling. The fire modeling showed that when the dispensers are place 72" apart, a fire from one unit will not spread to an adjacent unit. The concept of 72" separation was based on corridor widths in health care, but the fire spread modeling still holds true whether the units are in health care facilities or not.

F233-04/05 introduced ABHR dispensers into the IFC, and referenced the fire modeling performed to justify the 72" separation. The fire modeling demonstrated that separation of 72" kept the fire contained to one unit and it did not involve adjacent dispensers. ABHR dispensers are appearing in all types of occupancies, but the separation between devices needs to be maintained.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no cost impact by this Public Comment. The requirement is already in the code and is an operational requirement, not a construction requirement.

Public Comment# 2850

F210-21

Proposed Change as Submitted

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)

2021 International Fire Code

Revise as follows:

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank vehicles and tank cars into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5 or where permitted and *approved* in accordance with Section 5707 of this code.

Reason: Section 5707 specifically addresses on-demand mobile fueling operations, while 5706.5.4 is more generally dispensing from tank vehicles or tank cars into motor vehicles. However, with no clear distinction between the two types of operations or a tank vehicle vs a mobile fueling vehicle, these two sections could appear to have conflicting allowances. This proposal simply eliminates that potential conflict by providing a pointer from 5706.5.4 to 5707.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal is an editorial code change and is only meant to clarify the code and eliminate contradictions in the code.

F210-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved based upon the action on F209-21 and the fact this section is unique from on-demand mobile fueling. (Vote: 13-0)

F210-21

Individual Consideration Agenda

Public Comment 1:

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) requests As Submitted

Commenter's Reason: The PC was provided as the link to Section 5707 was important. Mobile fuel vehicles are a form of Tank Vehicle(See Section 5707.2.1) therefore, Section 5706.5.4 deals with dispensing fuel from tank vehicles into the fuel tanks of motor vehicles. Without the connection provided by this proposed change, Section 5706.5.4 could be interpreted to be more restrictive and limit what a mobile fueling vehicle is permitted to do. The connection allows Section 5707 to dictate the requirements for on-demand mobile fueling operations and does not change and provisions.

To clear up any confusion about how the approved proposal F209 would blend with this proposal, below we show how the language of both proposals would work together, showing they do not conflict with each other.

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank cars into the fuel tanks of motor vehicles shall be prohibited.
Dispensing from tank vehicles ~~and tank cars~~ into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5 or where permitted and *approved* in accordance with Section 5707 of this code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change proposal is an editorial code change and is only meant to clarify the code and eliminate contradictions in the code.

Public Comment# 2998

F211-21

Proposed Change as Submitted

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)

2021 International Fire Code

Revise as follows:

5706.5.4.1 Marine craft and special equipment. Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment where *approved* by the *fire code official*, and where:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.
3. The dispensing line does not exceed 50 feet (15 240 mm) in length.
4. The dispensing nozzle is *approved*.
5. The operation shall be in accordance with Sections 2310.4.1 and 2310.4.2 except where *approved* in accordance with Section 5707.

Reason: This proposal ties together Section 2310.4, Section 5706.5.4, and Section 5707 for fueling marine craft from tank vehicles or mobile fueling vehicles. Without this tie, there is the appearance of conflicting provisions where a Class I would not be permitted under 2310.4, but potentially permitted under 5707, and silent in 5706.5.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no anticipated cost of construction increase. This is simply a coordination of related code sections.

F211-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Although the correlation with Section 2310.4 may be appropriate the reference to Section 5707 confuses the issue. Section 5707 if dealing with on-demand mobile fueling which is a different concept. The proponent is encouraged to revise this proposal through public comment to make the correlation back to Section 2310.4. (Vote: 13-0)

F211-21

Individual Consideration Agenda

Public Comment 1:

IFC: 5706.5.4.1

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) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

5706.5.4.1 Marine craft and special equipment . Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment where *approved* by the *fire code official*, and where:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.

3. The dispensing line does not exceed 50 feet (15 240 mm) in length.

4. The dispensing nozzle is *approved*.

5. The operation shall be in accordance with Sections 2310.4.1 and 2310.4.2. ~~except where *approved* in accordance with Section 5707.~~

Commenter's Reason: In accordance with the committee action hearing the reference to section 5707 has been removed and the references to 2310.4 have been maintained.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is no anticipated cost of construction increase. This is simply a coordination of related code sections

Public Comment# 2753

F212-21

Proposed Change as Submitted

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

2021 International Fire Code

Revise as follows:

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where approved ~~permitted~~, provided that such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The *owner* of a mobile fueling operation shall provide to the jurisdiction a written response plan that demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained on the site property; and the scale of the site plan.

   Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other *approved* means.
4. The *fire code official* is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not open to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

   Exceptions:

   1. The distance to storm drains shall not apply where an *approved* storm drain cover or an *approved* equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
   2. The distance to storm drains shall not apply for drains that direct influent to *approved* oil interceptors.

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
13. Tank vehicles shall be equipped with a "fuel limit" switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

    Exception: Tank vehicles where the operator carries and can utilize a remote emergency shutoff device that, when activated, immediately causes flow of fuel from the tank vehicle to cease.
14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle

and dispense motor fuels.

17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

Reason: Section 5706.5.4.5 covers fleet fueling operations, which require an operating permit to be conducted. This proposal does two things, adds Class I liquids to the fuels that can be dispensed, and replaces “where permitted” (an undefined term), with “where approved”, which clarifies that the fire code official needs to approve the mobile fueling to be conducted at various facilities and sites.
We understand that fleet fueling of Class I liquids, in addition to Class II or III liquids, has already been accepted in many state codes (e.g., Ohio State Fire Code & Oregon State Fire Code), and this is consistent with NFPA 30A, Section 9.6. However, like all fleet fueling operations, fleet fueling of Class I liquids is only allowed when approved by the fire code official, and is covered by an operational permit per Section 105.6.16.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal expands the fuels that can be dispensed at these operations so will not increase cost of compliance.

F212-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as it a reasonable allowance. This operation deals with commercial, governmental, industrial and farming installations which is limited to certain location and the fire code official will be involved with issuing an operational permit so it will be properly regulated. The term "approved" as revised gives clear authority to the fire code official. There is some concern that this could encourage bypassing compliance with Section 5707. (Vote: 9-5)

F212-21

Individual Consideration Agenda

Public Comment 1:

IFC: 5706.5.4.5

Proponents: Robert Davidson, representing Self (rjd@davidsoncodeconcepts.com) requests As Modified by Public Comment

Modify as follows:

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where approved~~, permitted, provided that such~~ Dispensing operations for Class I motor vehicle fuel shall be conducted in accordance with Section 5707 , dispensing operations ~~are~~ for Class II and III motor vehicle fuel shall be conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The *owner* of a mobile fueling operation shall provide to the jurisdiction a written response plan that demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained on the site property; and the scale of the site plan.

   Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other *approved* means.
4. The *fire code official* is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not open to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

   Exceptions:

   1. The distance to storm drains shall not apply where an *approved* storm drain cover or an *approved* equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
   2. The distance to storm drains shall not apply for drains that direct influent to *approved* oil interceptors.

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
13. Tank vehicles shall be equipped with a "fuel limit" switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

    Exception: Tank vehicles where the operator carries and can utilize a remote emergency shutoff device that, when activated, immediately causes flow of fuel from the tank vehicle to cease.
14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.

21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

Commenter's Reason: Extending the ability to include Class I motor fuels for fleet motor fueling is appropriate, but not by simply adding Class I to the existing scoping section.
The existing fleet motor fueling requirements were developed to provide for safe dispensing involving the hazards associated with Class II and III motor fuels, not Class I motor fuels. This was issue reviewed when On-Demand Mobile Fueling was added to the fire code and why a separate section, Section 5707, was created to specifically address the hazards associated with Class I motor fuels.

If one takes the time to compare the safety requirements of Section 5706.5.4.5 for fleet motor fueling with those of Section 5707 for on-demand mobile fueling there are major differences in the safety requirements such as:

	Class II and III Section 5706.5.4.5	Class I Section 5707
Separation from buildings and lot lines	15'	25'
Tank Vehicle/mobile fuel vehicle fuel limits	None	1600/800/60 gal
Fuel limit switch	500 gal	30 gal
Dispensing hose length	100'	50'
Fire extinguisher rating	40:BC	4A:80-BC
Approval and listing of nozzles and hoses	None	Required
Listed breakaway at nozzle	None	Required
Safety Cones	None	Required
Vehicle Flashers	None	Required
Night delivery lighting	None	Required

What this public comment does is modify the added language to provide for dispensing of Class I motor fuels by pointing to Section 5707 where the proper safety precautions for dispensing the Class I motor fuels are located in the fire code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not address construction requirements. It addresses motor fuel dispensing operational issues.

Public Comment# 2874

F214-21

Proposed Change as Submitted

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

105.5.18 Flammable and combustible liquids. An operational permit is required:

1. To use or operate a pipeline for the transportation within facilities of *flammable* or *combustible liquids*. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOTn) nor does it apply to piping systems.
2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the *fire code official*, would cause an unsafe condition.

   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures where such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.
4. To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.

   Exception: Fuel oil and used motor oil used for space heating or water heating.

5. To remove Class I or II liquids from an underground storage tank used for fueling motor vehicles by any means other than the *approved*, stationary on-site pumps normally used for dispensing purposes.
6. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where *flammable* and *combustible liquids* are produced, processed, transported, stored, dispensed or used.
7. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground *flammable* or *combustible liquid* tank.
8. To change the type of contents stored in a *flammable* or *combustible liquid* tank to a material that poses a greater hazard than that for which the tank was designed and constructed.
9. To manufacture, process, blend or refine *flammable* or *combustible liquids*.
10. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or to engage in on-demand mobile fueling operations in accordance with Section 5707.
11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 ~~or, where required by the *fire code official*, to utilize a site for on-demand mobile fueling operations in accordance with Section 5707~~.

5707.1.1 Approval required. Mobile fueling operations shall not be conducted without first obtaining a *permit* and approval from the *fire code official*. ~~Mobile fueling operations shall occur only at *approved* locations. The *fire code official* is authorized to approve individual locations or geographic areas where mobile fueling is allowed.~~

5707.3.1 Safety and emergency response plan. Mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code. At a minimum, the plan shall ensure that operators take into consideration the following prior to commencing fueling:

1. Location of all buildings and structures.
2. *Location of lot lines* or property lines.
3. Location of electric car chargers and solar photovoltaic parking lot canopies.
4. Location of appurtenances on-site and their use or function.
5. Uses adjacent to the *lot lines* of the site.
6. Locations of storm drain openings and adjacent waterways or wetlands.

7. Information regarding slope, natural drainage, curbing and impounding.

8. How a spill will be kept on the site property.

Delete without substitution:

~~**5707.3.3 Site plan.**~~
~~Where required by the *fire code official*, a site plan shall be developed for each location or area at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate the following:~~

1. ~~All buildings and structures.~~
2. ~~*Lot lines* or property lines.~~
3. ~~Electric car chargers.~~
4. ~~Solar photovoltaic parking lot canopies.~~
5. ~~Appurtenances on-site and their use or function.~~
6. ~~All uses adjacent to the *lot lines* of the site.~~
7. ~~Fueling locations.~~
8. ~~Locationsof all storm drain openings and adjacent waterways or wetlands.~~
9. ~~Information regarding slope, natural drainage, curbing and impounding.~~
10. ~~How a spill will be kept on the site property.~~
11. ~~Scale of the site plan.~~

Reason: Permitting each site at which on-demand mobile fueling occurs has proven to be unpractical, time consuming and expensive with no added safety value. This proposal takes out the site-permitting requirements and places the responsibility of fueling onto the mobile fueling operator, similar to a hot-work permit. The mobile fueling operator will still have to have a valid operator permit, at which time jurisdictions can ensure that comprehensive training and safety plans are provided. Fire code officials can still enforce the code if they see violations, pulling the operator permit if necessary. This provides greater incentive to operators to operate within the limitations of the Code while reducing unnecessary paperwork and time spent on site permits.

Cost Impact: The code change proposal will decrease the cost of construction
This code change will decrease the cost of operations by reducing paperwork and downtime while waiting for permits. It will have no effect on construction costs.

F214-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as it takes away the specific site plan requirement and depends too much on the operator to simply follow a safety plan. Site plans are necessary to know where this is happening and in some cases may cause fueling is prohibited in certain locations based upon specific concerns with the site. Although these site plans are filed away they will likely be used in case of emergency. There is concern with how the operator will "take into consideration" the items proposed for the safety and emergency response plan. It was also noted that fueling location the scale of site plan and how spills will be handled are not addressed in revised Section 5707.3.1. The committee agreed that this language could be cleaned up but there were too many concerns as proposed. (Vote: 14-0)

F214-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com); John Catlett, representing BOMA International

(catlettcodeconsulting@gmail.com) requests As Submitted

Commenter's Reason: There was a lot of support for this proposal, and even the opposition was only slight opposition. It is unrealistic that a filed-away site plan would be used in an emergency situation. Furthermore, all cosideratoins that would be in a site plan are monitored in real time by the operator. This proposal simply makes sense, and if an operator is not able to safely fuel gas, then their operator license will be pulled from a jurisdiction and they cannot operate anywhere.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This code change will decrease the cost of operations by reducing paperwork and downtime while waiting for permits. It will have no effect on construction costs.

Public Comment# 2728

F219-21

Proposed Change as Submitted

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Revise as follows:

5707.2.1 Mobile fueling vehicle classifications. An on-demand mobile fueling vehicle shall be characterized as one of the following:

1. **Tier 1 mobile fueling vehicle.** A tank vehicle that complies with NFPA 385 and that has chassis-mounted tanks where the aggregate capacity does not exceed ~~1,600~~ 4,500 gallons (~~6057~~ 17,034 L).
2. **Tier 2 mobile fueling vehicle.** A vehicle with one or more chassis-mounted tanks or containers that do not exceed 110 gallons (416 L) in capacity with an aggregate capacity that does not exceed 800 gallons (3028 L) or the weight capacity of the vehicle in accordance with DOTn.
3. **Tier 3 mobile fueling vehicle.** A vehicle that carries a maximum aggregate capacity of 60 gallons (227 L) of motor fuel in metal safety cans *listed* in accordance with UL 30 or other *approved* metal containers, each not to exceed 5 gallons (19 L) in capacity.

Reason: The 1600-gallon aggregate limit on the maximum capacity of a Tier 1 mobile fueling vehicle does not reflect the industry standard size for a mid-volume tank truck (approx. 2800 to 4500 gallons). Other than the fuel capacity differences, all Tier 1 mobile fueling vehicles are also required to comply with the requirements of Section 5706.6, and NFPA 385. The safety record for on-demand fueling operations the past few years should justify an increased fuel vehicle capacity, provided the size of the vehicles themselves do not pose obstruction and other difficulties.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal expands what equipment can be used by 3rd-party companies and in no way affects construction costs.

F219-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal was disapproved as the increase in tank size is seen as excessive. No proposed mitigation for increased hazard has been presented nor has specific justification for the increase been provided. It should be noted that this proposal was heard prior to F218-21. (Vote: 14-0)

F219-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com); John Catlett, representing BOMA International (catlettcodeconsulting@gmail.com) requests As Submitted

Commenter's Reason: This proposal was disapproved because no mitigation was proposed for the "increased hazard" of a greater quantity of fuel. These are tank vehicles, therefore there is no additonal hazard associated with the greater cargo capacities. The vehicles are all equipped with fuel limit switches, and a complete loss of containment event is deemed incredible for a tank vehicle.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change proposal expands what equipment can be used by 3rd-party companies and in no way affects construction costs.

Public Comment# 2731

F225-21

Proposed Change as Submitted

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2021 International Fire Code

Add new text as follows:

5707.5 Garage Fueling.
Where permitted by the *fire code official*, mobile fueling operations conducted in parking structures shall comply with Sections 5707.5.1 through 5707.5.8.

5707.5.1 Automated parking structures.
Vehicles shall not be fueled where elevated on a lift or stacker. Fueling shall be prohibited in automated and assisted-mechanical type parking structures.

5707.5.2 Floor levels. .
Mobile fueling shall be limited to the floor level of fire department access.

Exceptions:
Where fire department vehicle access is deemed acceptable to the *fire code official* , mobile fueling shall be permitted in parking structures of Type I construction, protected througout with an automatic sprinler system in accordance with Section 903.3.1.1 and comply with one of the following:

1. Up to three floor levels above or below the level of fire department vehicle access.
2. Up to 70 ft above grade level in open parking garages

5707.5.3 Maximum cargo capacity.
The cargo capacity of mobile fueling vehicles operating inside of parking structures shall not exceed 1600 gallons (6057 L).

5707.5.4 Fire extinguisher.
In addition to the fire extinguisher required by Section 5707.7.4, mobile fueling vehicles operating in parking structures shall be equipped with a minimum 2.5 gallon AR-AFFF vapor suppressing extinguisher. Extinguishers shall be maintained at a temperature within the manufacturer's limits.

5707.5.5 Spill mitigation.
Mobile fueling operators shall place a sock down grade from or around the area of fueling prior to fueling. When a spill or unplanned discharge occurs, the operator shall immediately cover the spill with the discharge of the vapor suppressing extinguisher.

5707.5.6 Audible alert.
In addition to the vehicle lights required in accordance with Section 5707.8.4, mobile fueling vehicles operating in garages shall emit an audible tone identical to the audible reversing alarm of the vehicle.

5707.5.7 Fuel limit.
The mobile fueling vehicle's *fuel limit switch* shall be set to a maximum of 5 gallons (19 L).

5707.5.8 Electrical equipment.
Mobile fueling shall not occur within 20 feet of electrical equipment located within 18 inches of the ground unless such electrical equipment is rated for Class I, Division 2 hazardous locations in accordance with the NFPA 70.

Reason: Over the past year, especially, mobile fueling has shown itself to be an indispensable service where available. Unfortunately, mobile fueling is unavailable in many cities because of space restrictions causing the need for garaged parking instead of lot parking. This code change proposal presents reasonable safeguards to allow the service to safely commence within structured parking.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change does not affect construction cost as it is simply adding provisions allowing garage mobile fueling.

F225-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal would allow mobile fueling within garages based only on the fire access being approved with no other criteria. There was concern with a sprinkler system being able to control a fuel spill fire within a parking garage that will be a much larger fire than a typical vehicle fuel fire. In addition NFPA 30A does not yet allow this activity. (Vote: 14-0)

F225-21

Individual Consideration Agenda

Public Comment 1:

IFC: 5707.5.1, 5707.5.2

Proponents: Andrew Klein, representing Booster Fuels (andrew@asklein.com); John Catlett, representing BOMA International (catlettcodeconsulting@gmail.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

5707.5.1 ~~Automated parking structures~~ Openness . ~~Vehicles shall not be fueled where elevated on a lift or stacker. Fueling shall be prohibited in automated and assisted-mechanical type parking structures.~~
Fueling operations shall be limited to open parking garages.

Exception: Where *approved* by the *fire code official*, fueling shall be permitted in closed parking garages while all vehicular access doors are in the fully open position.

5707.5.2 ~~Floor levels. levels.~~ Location . Mobile fueling shall be limited to the floor level of fire department ~~access.~~ access in garages of noncombustible construction . Vehicles shall not be fueled where elevated on a lift or stacker. Fueling shall be prohibited in automated and assisted-mechanical type parking structures.

~~**Exceptions:**~~
~~Where fire department vehicle access is deemed acceptable to the *fire code official*, mobile fueling shall be permitted in parking structures of Type I construction, protected througout with an automatic sprinler system in accordance with Section 903.3.1.1 and comply with one of the following:~~

1. ~~Up to three floor levels above or below the level of fire department vehicle access.~~
2. ~~Up to 70 ft above grade level in open parking garages~~

Commenter's Reason: There is a commercial need for fueling inside of garages for corporate vehicles that are stored in garages. This PC significantly restricts where a fire code official is able to approve mobile fueling operations within a garage. Procedures include mitigative controls sufficient to account for the increased risks of fueling in a garage.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not affect the cost of construction.

Public Comment# 2856

F228-21

Proposed Change as Submitted

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (Eirene.Knott@brrarch.com)

2021 International Fire Code

SECTION B104
FIRE-FLOW CALCULATION AREA

Revise as follows:

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building~~, except as modified in Section B104.3~~.

Exceptions:

1. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.
2. Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

Delete without substitution:

~~**B104.3 Type IA and Type IB construction.**~~
~~The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.~~

~~**Exception:** *Fire-flow calculation area* for open parking garages shall be determined by the area of the largest floor.~~

Reason: My intention with this code change is to clarify the intention of the exception for parking garages. The way the current language reads, it implies that the exception only applies to parking garages of Type IA and IB construction as that's the charging language here. If one reads this in black and white, the exception will only apply to Types IA and IB parking garages, but that is not the intention. The intention is for parking garages to allow for this method of calculation and should not be noted as an exception just to Type IA and IB construction. By moving the language around, I believe this now clearly indicates that parking garages have their own method of calculation as do Types IA and IB construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This should not have any impact on the construction cost, but it may actually reduce the cost if this code language has been misinterpreted.

F228-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was the uncertainty of changing the technical requirement from the original intent for the fire flow requirement in open parking garages of Type IA and IB construction. (Vote: 11-3)

F228-21

Individual Consideration Agenda

Public Comment 1:

IFC: SECTION B104, B104.1, B104.2

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com) requests As Modified by Public

Comment

Modify as follows:

2021 International Fire Code

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General . The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building.

Exceptions:

1. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.
2. Fire-flow calculation area for open parking garages of Type IA and IB construction shall be determined by the area of the largest floor.

B104.2 Area separation . Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

Commenter's Reason: During the committee hearings, the history of the flow calculations for the open parking garage was discussed. The language came from the BOCA code which allowed for parking garages of Types I and IIA to meet the area of the largest floor. The exception only applied to parking garages for those two construction types. This public comment is providing for that language to be added to the parking garage exception so as to clearly identify that the exception for parking garage calculations would apply only to those construction types rather than a universal exception for all construction types.
Based on the fire flow calculations, both the Types IA and IB are exceptions due to the nature of the construction type. The same exception applies to parking garages but only to Types IA and IB, which is what I'm attempting to clarify in this code change. I am not trying to change anything on how the calculations are determined, but rather to clarify that the permission for the parking garage calculation is specific to only Types IA and IB construction. All other parking garages would then be calculated as directed in B104.1.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is merely to clarify existing language; it should not impact construction costs.

Public Comment# 2334

F229-21

Proposed Change as Submitted

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org)

2021 International Fire Code

Revise as follows:

TABLE B105.1(2) REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	2
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	3
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	4
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	
203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000	
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250	
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500	
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750	
295,901–Greater[c]	166,501–Greater[c]	106,501–115,800	77,001–83,700	47,401–51,500	6,000	
—	—	115,801–125,500	83,701–90,600	51,501–55,700	6,250	
—	—	125,501–135,500	90,601–97,900	55,701–60,200	6,500	
—	—	135,501–145,800	97,901–106,800	60,201–64,800	6,750	
—	—	145,801–156,700	106,801–113,200	64,801–69,600	7,000	
—	—	156,701–167,900	113,201–121,300	69,601–74,600	7,250	
—	—	167,901–179,400	121,301–129,600	74,601–79,800	7,500	
—	—	179,401–191,400	129,601–138,300	79,801–85,100	7,750	
—	—	191,401–Greater[c]	138,301–Greater[c]	85,101–Greater[c]	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

c. For fire flow calculation areas greater than the value, the fire code official is authorized to require additional fire flow, based on a consideration of access, fire hazards, exposure, and capabilities of the fire department.

Reason: The limitations of the fire flow calculation area are sourced back to the fire suppression rating schedule calculations. However, unlimited area buildings do create unique challenges for fire departments and additional fire flow might be needed to control fires due to unique exposures, multiple exposure protection, and the geometry of the building. The fire code official should have the ability to account for these specific needs when the values of the table are outside the original targeted protection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides guidance to building arrangements not previously addressed.

F229-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that modifying Section B103.2 is probably the better place to do it and there are prescriptive ways of calculating fire flow for these kinds of buildings that use square footage or volume or a number of different ways that are a much better way to approach this rather than changing the table. Additionally, it was noted the proposal is too open ended and there would also need to be some coordination with the water utility because the fire code official could require something that's not technically feasible that will exhaust the capacity of the water system. (Vote: 13-1)

F229-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Daniel Nichols, representing Metropolitan Transportation Authority, Construction and Development (dnichols@mnr.org) requests As Submitted

Commenter's Reason: We are requesting that the membership consider acceptance of proposal F229-21 and offer the following responses to the committee's reason and that of the testifiers on the proposal:
Methodology- The committee reason statement states there are other methods to calculate fire flow, such as the area or volume of the building. We agree that there are other methods to complete fire flow calculations and those are always available to the fire code official within the charging language for "approved fire flow" in Chapter 5 of the IFC. This proposal only effects the appendix, which is available for adoption by the jurisdiction or, if not adopted, reference by the fire code official as they see fit. An important note about the other fire flow methods mentioned: if we use the building scenario that this proposal cited (a Type IIB building 138,301 sf) the "area" method would require 46,100 GPM and the "volume" method would require 27,600 GPM. Whereas the aforementioned numbers are not achievable, locations like industrial complexes with dedicated fire protection water systems can easily get flows higher than 2,000 GPM.

Water Purveyors- One of the testifiers stated that it would be impossible for many water purveyors to provide such a fire flow. We do understand that issue for buildings being constructed wholly supplied by municipal sources, but it places a limitation on fire code officials requiring upgrades to dedicated fire protection water supplies, providing alternative water supply availability, as well as pushing projects to incorporate, fire sprinklers, fire walls and/or fire-rated construction to limit the fire flow calculation values.

We would ask the membership to reflect on their community and the challenges that the fire service has in providing adequate water supplies for buildings. This is not a transportation-related issue and effects many projects where large buildings are being constructed without consideration of the existing infrastructure.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This correction for buildings that exceed the values in Appendix B would increase the cost of construction if the jurisdiction adopts it.

Public Comment# 2873

F230-21

Proposed Change as Submitted

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org)

2021 International Fire Code

Revise as follows:

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to 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).

Exception: An additional fire apparatus access road required by this appendix is permitted to be a sidewalk, driveway, pathway, court or other approved surface not accessible to public motor vehicles where designed by a registered design professional to meet the loading requirements and minimum specifications of this appendix, and the surface provides all-weather driving capabilities.

Reason: The current provisions of IFC Section 503, Appendix D and the definition of “fire department apparatus road” as written can be interpreted to require the construction of an actual road, street, lane or other feature potentially accessible to public vehicular traffic as well as fire department vehicles, complete with curbs and gutters, shoulders and other components and making a complete intersection with a main road, street, highway, etc. adjacent to the development. However, for long, narrow parcels of land which can only be physically accessed along one of the narrow sides, such an interpretation may result in placing the intersection created by the second access road closer to the main access to the development than is permitted by local highway or zoning ordinances.
Nothing in IFC Section 503 or Appendix D requires the additional road intersect a public way at the same elevation as the public way, or even be a true “road” accessible to vehicular traffic. A code-compliant “road” could simply be a sidewalk or other pathway primarily intended for pedestrian use but constructed to meet the width, loading and other requirements of a fire apparatus access road. Such a walking path would not need to form a true intersection with public streets but could simply end at a sloped or roll-up curb. The proposed exception clarifies such methods of constructing the additional fire department apparatus "road" are acceptable.

Cost Impact: The code change proposal will decrease the cost of construction
The exception could reduce the cost of constructing a fire apparatus access road by allowing for the elimination of curbs and gutters or other elements associated with a road open to public vehicles. The exception would also enable more cost-effective development of sites where the only option under which development of the site would otherwise be permitted would be providing alternative, potentially costly, means of fire protection.

F230-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that one of reasons for disapproval was that the other pathways that are listed in the proposal may not be recognized as fire apparatus roads by the fire department, they could potentially slow response time and the locations listed are prone to obstructions. Another reason for disapproval was the need for a requirement to permanently identify these as a fire lane. (Vote: 12-2)

F230-21

Individual Consideration Agenda

Public Comment 1:

IFC: D102.1

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

D102.1 Access and loading . Facilities, buildings or portions of buildings hereafter constructed shall be accessible to 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).

Exception: Where two ~~An additional~~ fire apparatus access road s arerequired by Section 503.1.2 or by Sections D104, D105 or D106 ~~this appendixis~~ , the additional fire apparatus access road is permitted to be a ~~sidewalk,~~ driveway, pathway, court or other approved *fire lane*~~surface~~ not accessible to public motor vehicles where designed by a registered design professional to meet the loading requirements and minimum specifications of Section 503 and this appendix, and the surface provides all-weather driving capabilities. Marking or signs shall be provided in accordance with Section 503.3 and Section D103.6.

Commenter's Reason: This public comment addresses the IFC committee concerns with the proposal as well as those brought up by opponents in testimony. The proposed exception is revised to refer to the code-defined term “fire lane”. As defined in Chapter 2, a fire lane need not be accessible to public vehicular traffic and can be a passageway other than an actual road. A requirement for marking or signs identifying the additional path as a fire lane is also provided. Such marking or signs are already required by Section 503 and Appendix D regardless of whether a fire apparatus access road is open to public traffic or not. However, to address concerns the alternate means of passage for fire apparatus needed to be identified, a pointer to the existing marking and signage requirements is provided.

In addition, a pointer to the base code requirements for fire apparatus access roads in Section 503 is provided, addressing concerns those requirements needed to be referenced in addition to the dimensional and loading requirements within Appendix D. This will insure the minimum 20 foot width required per Section 503.2.1, the requirement to maintain the access road or fire lane unobstructed per Section 503.4, and the requirements for gates where they are provided are all recognized and maintained. To provide further clarity and reduce confusion, the reference to sidewalks is deleted. Should one want to construct a walkway or bikeway that can double as an access road or fire lane, those are covered under "pathway" as well as the "passageway" allowed for a fire lane.

Finally, it is clarified that the exception is intended to apply both where Appendix D provisions trigger a second fire apparatus access road based on the size of a building project, the number of dwelling units in a multifamily building, or the number of one- and two-family dwellings in a development and where the fire code official requires an additional access rod under the authority granted in Section 503.1.2.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction

The original proposal could reduce the cost of constructing a fire apparatus access road by allowing for the elimination of curbs and gutters or other elements associated with a road open to public vehicles and enabling more cost-effective development of larger parcels. Since marking or signage is already required by the code and Appendix D, adding the pointer to those requirements does not change the cost of construction.

Public Comment# 2718

F231-21

Proposed Change as Submitted

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org)

2021 International Fire Code

Revise as follows:

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with two separate and *approved* fire apparatus access roads.

Exceptions:

1. Where there are more than 30 *dwelling units* accessed from a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.
2. Where the number of *dwelling units* on a single public or private fire apparatus access road does not exceed 50, the minimum unobstructed width of the single fire apparatus access road is 26 feet (7925 mm), and the development is not located in a wildand-urban interface area as defined in the *International Wildland-Urban Interface Code*, access from two directions shall not be required.
3. ~~2.~~ The number of *dwelling units* accessed from a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

Reason: One of the barriers to affordable housing frequently cited by NAHB members is availability of lots for development. In some cases, the dimensions of such parcels, surrounding development, surrounding terrain or other constraints make it difficult if not impossible to provide a second fire department apparatus road, even if constructed as a sidewalk, bike path or other feature only accessible to fire trucks, not accessible to public motor vehicles. A developer may either be faced with having to sacrifice planned dwelling units or providing alternative, potentially costly, means of fire protection in order to construct the development. Either solution increases the cost of construction for the homes in the development and may render them unaffordable to homebuyers or renters with modest incomes. Or, the developer may be forced to abandon the lot, meaning the IFC has improperly acted as a de facto zoning code.
The current 30 dwelling trigger is low compared to a multifamily development can contain up to 100 units. One of the reasons for the second fire department apparatus road is in case the primary access to the development is blocked by traffic congestion or an accident. Given the average household size is between 2 and 3 people, clearly a 100-unit multifamily building is likely to generate more traffic than 30 single-family houses. Average lot size has also been shrinking, so if travel distance is a concern it will take less time for fire equipment to traverse many current single-family developments than it may have previously. There is no reason for such a low trigger as 30 homes.

This proposal adds an exception that raises the trigger to 50 dwellings, or half the number of dwelling units at which a multifamily development triggers the second fire department apparatus road, if the minimum unobstructed width of the primary fire department apparatus road is increased to 26 feet in width to aid in both fire department access and evacuation, and the development is not in a wildfire-prone area.

Cost Impact: The code change proposal will decrease the cost of construction
The proposal will reduce the cost of constructing for developments of 31 to 50 houses by eliminating the need for the second fire apparatus access road and enabling development of slightly larger parcels. The exception would also enable more cost-effective development of sites where the only option under which development of the site would otherwise be permitted would be providing alternative, potentially costly, means of fire protection.

F231-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that one of the reasons for disapproval was the issue of the hydrant locations and spacing that may need to be considered in the requirement. It was also noted that the proponent should consider the format of using an exception that may be better placed in a separate section. Additionally, it was stated that the 50 dwelling unit criteria is a lot of dwelling units on one road especially one that is a dead-end road. (Vote: 11-3)

F231-21

Individual Consideration Agenda

Public Comment 1:

IFC: D107.1, D107.1.1 (New), D107.1.2 (New)

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org) requests As Modified by Public Comment

Modify as follows:

2021 International Fire Code

D107.1 One- or two-family dwelling residential developments . Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with two separate and *approved* fire apparatus access roads.

Exceptions:

1. Where there are more than 30 *dwelling units* accessed from a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.
2. Where there are not more than 50 dwellings on a single public or private fire apparatus access road complying with Section D107.1.1. ~~Where the number of *dwelling units* on a single public or private fire apparatus access road does not exceed 50, the minimum unobstructed width of the single fire apparatus access road is 26 feet (7925 mm), and the development is not located in a wildand-urban interface area as defined in the *International Wildland-Urban Interface Code*, access from two directions shall not be required required.~~ .
3. ~~The number of *dwelling units* accessed from a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official.*~~

D107.1.1 One- or two-family dwelling residential developments having not more than 50 units .
Developments of one- or two-family dwellings where the number of dwelling units does not exceed 50 shall be permitted to have a single approved fire apparatus access road provided all of the following requirements are met:

1. The minimum unobstructed width of the single fire apparatus access road shall be 26 feet (7925 mm) and shall otherwise comply with Section 503 and Section D103.
2. Where the fire apparatus access road exceeds 150 feet in length the width and turnaround provisions of Section D103.4 shall be met.
3. A minimum of one fire hydrant on each side of the fire apparatus access road in accordance with Section 507.5 shall be provided. The fire code official shall be permitted to require additional hydrants and hydrant spacing based on the length of the fire apparatus access road, fire flow requirements, and the distance from any point on the street or road frontage to a hydrant.
4. The development is not located in a wildand-urban interface area as defined in the *International Wildland-Urban Interface Code.*

D107.1.2 Future Development . The number of *dwelling units* on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official.*

Commenter's Reason: This public comment addresses the IFC Committee reasons for disapproval of F230-21 as well as issues brought up by testifiers. The primary concerns were the clarity of the new exception, the possibility of the road being blocked by hoses, and the number of dwellings that could be on a dead-end road.
First, the allowance for a development having 50 or fewer dwellings is moved to its own subsection, with a pointer retained as new Exception #2, and the qualifiers are converted into a numbered list. This addresses the committee's suggestion the alternative would be better placed in its own section and generally improves the clarity.

Second, a requirement is added that at least one hydrant be placed on each side of the road, and a pointer to the hydrant spacing requirements of Section 507.5 is provided. This addresses concerns by committee members and opponents that access via a single road could be blocked if fire hydrants are only provided on one side of the road, as hoses may need to extend across the road and cannot be driven over. In addition, invoking the Section 507 requirements allows the fire code official to further modify the hydrant location and spacing to minimize the possibility of needing to extend hoses across the road.

Finally, a pointer to the dead-end turnaround requirements in Section D103.4 is added to address concerns raised about a single dead-end access road. It is noted As the D101.1 Scope provision requires a single road to comply with all the requirements of Section 503 and Appendix D the turnaround requirements should be triggered anyway, but there is certainly no harm in underscoring the fact a turnaround needs to be provided. It is noted Table D103.4 requires the fire code official to approve the minimum width and turnarounds for dead-end access roads exceeding 750 in length. Thus the code already addresses the issue of a longer road that was brought up in testimony and empowers the fire code official to require a wider road and additional turnarounds.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original proposal will reduce the cost of constructing for developments of 31 to 50 houses by eliminating the need for the second fire apparatus access road and enabling development of slightly larger parcels. The public comment would increase the cost to construct a single access road due to the requirement for additional fire hydrants, but the proposal together with the public comment would still likely decrease the cost of construction for the entire development.

Public Comment# 2730

F236-21

Proposed Change as Submitted

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

2021 International Fire Code

Add new text as follows:

APPENDIX O
VALET TRASH AND RECYCLING COLLECTION IN GROUP R-2 OCCUPANCIES

.

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.About this appendix: Appendix O provides for trash and recycle collection services in Group R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.

SECTION O101
SCOPE

O101.1 Scope. Valet trash collection in Group R-2 Occupancies shall comply with this Appendix.

SECTION O102
DEFINITIONS

O102.1 Definitions. For the purpose of this appendix certain terms are defined as follows:
VALET TRASH COLLECTION. A service provided whereby trash or recycling is placed outside of dwelling units in approved containers during prescribed times for collection by another party.

SECTION O103
CONTAINERS

O103.1 General. Containers used for valet trash collection shall comply with Sections O103.2 through O103.5.

O103.2 Integrity. Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with tight-fitting lids.

O103.3 Height. Containers shall not exceed 30” in height.

Add new text as follows:

O103.4 Capacity and limit.
Individual containers shall not exceed 2.0 cubic feet (15 gallons) in capacity. Only one trash or recycling container per *dwelling uni*t or *sleeping unit* shall be permitted to be placed outside of the *dwelling unit* or *sleeping unit* at one time. Trash and recycling containers shall not be placed outside of a *dwelling unit* or *sleeping unit* at the same time.

O103.5 Construction materials.
Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

SECTION O104
CONTAINER LOCATION

O104.1 General. Placement of containers used for valet trash collection outside of a *dwelling unit* or *sleeping unit* shall comply with Sections O104.2 and O104.3.

O104.2 Minimum means of egress width. Containers used for *valet trash collection* shall not obstruct the minimum required egress width.

Add new text as follows:

O104.3 Stairways.

Containers used for *valet trash collection* shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an *interior exit stairway*.

SECTION O105
ADDITIONAL REQUIREMENTS

O105.1 Time limits. Filled containers used for valet trash or recycling services shall not be placed outside a dwelling unit for more than 6 hours within in any 24-hour period. Empty approved containers used for valet trash or recycling services shall not remain in a corridor for more than 12 continuous hours in a 24 hour period.

Add new text as follows:

O105.2 Collection rules.
The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all valet trash collection rules. A copy of the rules shall be provided to the *fire code official* upon request.

O105.3 Suspension of service.
The *fire code official* has the authority to order the suspension of *valet trash collection* that is not in compliance with this appendix.

SECTION O106
REFERENCED STANDARDS

TABLE O106.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM E1354-17	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	O103.5

O106.1 General. See Table O106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

Reason: Following rejection of a predecessor proposal last cycle, interested parties were welcome to participate in the FCAC discussion on this issue, and input was received from both the fire service and industry representatives. To be clear, this proposal is being advanced by FCAC to achieve reasonable and uniform regulations, and it is not something that was initiated as an industry proposal. Accordingly, FCAC did not feel that we should request or wait for industry to bring this forward vs. dealing with it as an FCAC initiative.
Currently, there are no provisions in the IFC specifically prohibiting or regulating the placement of combustible trash or recyclables in an exit access corridor, provided that such materials are not placed within the minimum required width of the means of egress. Code sections relevant to this discussion are as follows:

- IFC Section 315.3.2 specifically regulates "combustible materials" in the means of egress and does not prohibit combustible storage anywhere other than "exits or enclosures for stairways and ramps" or "during construction, demolition, remodeling or alterations." Accordingly, it is difficult to make a case that any other general section in the IFC possibly applicable to this discussion would be intended to add additional regulations for combustibles in exit access corridors when exit access corridors are specifically omitted from Section 315.3.2 and considering that IFC Section 102.10 establishes that specific provisions override general provisions in the event of a conflict.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 304.2, but that would require a determination that such materials constitute a "hazard to the public health, safety or welfare." A determination of that type is, at best, going to be inconsistent from jurisdiction to jurisdiction and is inconsistent with the "specific over general" rule established by IFC Section 102.10.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 1020.4, which requires that the minimum width of corridors not be obstructed, but there is no prohibition in this section of combustible material in a corridor if it does not obstruct the minimum required egress width.
- Some may argue that prohibition of valet trash can be accomplished under IFC Section 1032.2, which requires that a means of egress be maintained free from obstructions or impediments to full instant use in the case of fire or other emergency, but like Section 304.2, such determination is going to be inconsistent from jurisdiction to jurisdiction when it comes to valet trash services, and applying the code in this way would be inconsistent with the "specific over general" rule established by IFC Section 102.10.

Further, the issue of disallowing combustibles in corridors has been specifically adjudicated by ICC in two recent code cycles without being supported. Proposal F16-13 had FCAC recommending a change to Section 315.3.2 that would specifically disallow combustibles in corridors, and there was a failed Public Comment attempting to disallow combustibles in corridors serving an occupant load of 10 or more. Then, Proposal F20-16 recommended disallowing combustibles in corridors serving an occupant load of 30 or more, which was also unsuccessful. With ICC having three times rejected a change to the IFC that would disallow combustibles in corridors, any competent defense attorney would be well equipped to challenge a citation claiming that the presence of valet trash or recyclable materials in a corridor constitutes a code violation.

Nevertheless, the occurrence of inconsistent code interpretations and enforcement has become clear in discussions among fire code officials who participated in the FCAC work on this topic. Accordingly, this proposal seeks to add regulations for valet trash services into the IFC appendix, which will offer standardized regulations for jurisdictions choosing to allow the service. Jurisdictions choosing to take a different path and jurisdictions that already have statutory governance of valet trash service would have the option of not adopting the appendix. Regulations proposed for the appendix will establish reasonable precautions and restrictions, where adopted, including: 1) Reminding that containers for valet trash cannot obstruct the minimum egress width, 2) Regulating container construction to reduce fire risk, 3) Limiting the size of containers and requiring that they be equipped with "tight fitting" lids (some have mentioned that "tight fitting" is too vague for inclusion in the code, but the term is already used multiple times in the IBC and IFC), 4) Controlling the time of placement of containers outside of dwelling units, and 5) Providing suitable administrative controls.

Supporters of this proposal cite the value of reduced trash accumulation (a fire and health risk) inside of dwelling units by having frequent pickup service, the value of offering trash removal to elderly and disabled populations who have difficulty or are unable to get trash and recyclables to a trash collection area, and the value of the IFC offering specific controls for a currently unregulated service that is already occurring with plastic bags and highly combustible containers.

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

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal relates to operations in a building and is not associated with any building construction requirements.

F236-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

O102.1 Definitions.
VALET TRASH COLLECTION. A service that removes ~~provided whereby~~ trash or recycling materials ~~is~~ placed outside of dwelling units or sleeping units ~~in approved containers during prescribed times~~ for collection ~~by another party~~.

Committee Reason: Approval was based upon the need to provide a framework for jurisdictions available where needed. This practice occurs currently with no guidance. It was noted that the appendix can be customized by a jurisdiction to meet their specific needs. This new appendix will offer a rated container whereas no rating is currently required. Note that some committee members struggled with locating such provisions in the fire code and have concern about enforceability. The modification revises the definition to better explain what is intended to regulated. This clarifies also that it covers both dwelling units and sleeping units. (Vote: 9-5).

F236-21

Individual Consideration Agenda

Public Comment 1:

IFC: O102.1, O103.2, O103.5

Proponents: William Koffel, representing National Valet Trash and Recycling Valet Trash Association (wkoffel@koffel.com); Andrew Klein, representing Valet Living (andrew@asklein.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

O102.1 Definitions. For the purpose of this appendix certain terms are defined as follows:
VALET TRASH COLLECTION. ~~A~~ An intermediary service that removes trash or recycling materials placed outside of dwelling units or sleeping units for final collection.

O103.2 Integrity. Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with lids and the lid shall be in the fully closed position ~~tight-fitting lids.~~

O103.5 Construction materials . Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

Exceptions:

1. Containers in corridors or egress balconies in buildings protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Containers on egress balconies in buildings with noncombustible exterior wall coverings.

Commenter's Reason: The Public Comment attempts to place all the potential changes to the Committee Action in one location, F236-21. There are three revisions to what the Committee approved as modified:
1. The definition is revised to clarify that traditional curbside trash collection at single family homes is not impacted.

2. The container lid language from F237-1 has been included, which was language the Committee preferred.

3. Exceptions to the container material requirements have been proposed. These revisions are consistent with other provisions already in Section 304 for larger waste containers. The revisions are also consistent with what was approved by the NFPA Life Safety Technical Committee on Residential Occupancies during the development of the 2021 Edition of the *Life Safety Code*. The language was not included in the *Code* due to Certified Amending Motions submitted to both NFPA 1 and NFPA 101 but it has been submitted as a Public Input for reconsideration of the issue by the Committee. It should be noted that the NFPA Standards Council determined that valet trash service was a life safety issue and therefore should be addressed by the appropriate NFPA 101 Technical Committees.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal relates to operations in a building and is not associated with any building construction requirements. The proposed exceptions will reduce the operational costs for some buildings.

Public Comment# 2911

F237-21

Proposed Change as Submitted

Proponents: William Koffel, representing National Valet Trash and Recycling Valet Trash Association (wkoffel@koffel.com)

2021 International Fire Code

Add new text as follows:

APPENDIX O
VALET TRASH AN RECYLING COLLECTION IN GROUP R-2 OCCUPANCIES

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The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction. About this appendix: Appendix O provides for trash and recycle collection services in Group R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.

SECTION O101
SCOPE

O101.1 Scope.
Valet trash collection in Group R-2 Occupancies shall comply with this Appendix.

SECTION O102
DEFINITIONS

O102.1 Definitions.
For the purpose of this appendix certain terms are defined as follows:

VALET TRASH COLLECTION. A service provided whereby trash or recycling is placed outside of dwelling units in approved containers during prescribed times for collection by another party.

SECTION O103
CONTAINERS

O103.1 General.
Containers used for valet trash collection shall comply with Sections O103.2 through O103.5.

O103.2 Integrity.
Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and shall be equipped with lids and the lid shall be in the fully closed position

O103.3 Height.
Containers shall not exceed 30” in height.

0103.4 Capacity and Limit.
Individual containers shall not exceed 2.0 cubic feet (15 gallons) in capacity. Only one trash or recycling container per dwelling unit or sleeping unit shall be permitted to be placed outside of the dwelling unit or sleeping unit at one time. Trash and recycling containers shall not be placed outside of a dwelling unit or sleeping unit at the same time.

O103.5 Construction materials.
Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

Exception:
Containers in exterior egress balconies in buildings protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including the exterior egress balcony.

SECTION O104
CONTAINER LOCATION

0104.1 General.
Placement of containers used for valet trash collection outside of a dwelling unit or sleeping unit shall comply with Sections O104.2 and O104.3.

O104.2 Minimum means of egress width.
Containers used for valet trash collection shall not obstruct the minimum required egress width.

O104.3 Stairways. Containers used for valet trash collection shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an interior exit stairway.

SECTION O105
ADDITIONAL REQUIREMENTS

O105.1 Time limits. Filled containers used for valet trash or recycling services shall not be placed outside a *dwelling unit* for more than 6 hours within in any 24-hour period. Empty approved containers used for valet trash or recycling services shall not remain in a corridor for more than 12 continuous hours in a 24 hour period.

O105.2 Collection rules. . The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all valet trash collection rules. A copy of the rules shall be provided to the *fire code official* upon request.

O105.3 Suspension of service. The *fire code official* has the authority to order the suspension of valet trash collection that is not in compliance with this Appendix.

Revise as follows:

SECTION O106
REFERENCED STANDARDS

O106.1 General. See Table O106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE O106.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM E1354-17	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	O103.5

Reason: The proposal is identical to the FCAC proposal for a new valet trash appendix with two differences.

- **Section O103.2 Integrity** is revised to say that the lid must simply be in a closed position. IFC Sections 304 and 808.1 simply require lids on containers and do not reference "tight-fitting lids." The phrase “tight-fitting” is subjective. Does it require a means to keep the lid closed if the container is tipped? Some containers come with a security mechanism to limit access to the container. Is that what will be required? Requiring a lid to be in the closed position addresses the issue of containers being too full of material.

- **Section O103.4 Construction Materials** has a proposed exception for balconies in buildings with automatic sprinkler systems . The NFPA Life Safety Technical Committee on Residential Occupancies included several similar exceptions to the container requirements in a Second Revision approved by the Committee. It should be noted that the Second Revision was not upheld by the NFPA Standards Council based upon action taken on several Certified Amending Motions. The proposed language does not include all of the exceptions approved by the NFPA Committee; but rather, limits the exceptions to containers located on exterior egress balconies when the balcony and entire building are protected with an automatic sprinkler system. The proposed exception is consistent with provisions in Section 304 that address waste containers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
While the proposal does not impact the cost of construction of a building, the proposed language will decrease the cost of containers required for valet trash.

F237-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

O103.5 Construction materials. Containers and lids used for valet trash collections shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

~~**Exception:**~~
~~Containers in exterior egress balconies in buildings protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including the exterior egress balcony.~~

Committee Reason: This proposal was approved consistent with action on taken F236-21 and addresses a necessary need for lids on the trash or recycling container. The exception for exterior egress balconies in buildings equipped throughout with a sprinkler systems was eliminated as it was felt necessary that the containers still comply with the fire performance criteria. (Vote: 9-5)

F237-21

Individual Consideration Agenda

Public Comment 1:

IFC: O102.1

Proponents: William Koffel, representing National Valet Trash and Recycling Valet Trash Association (wkoffel@koffel.com); Andrew Klein, representing Valet Living (andrew@asklein.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Fire Code

O102.1 Definitions. For the purpose of this appendix certain terms are defined as follows:
VALET TRASH COLLECTION. ~~A~~ An intermediary service that removes ~~provided whereby~~ trash or recycling materials ~~is~~ placed outside of dwelling units or sleeping units for final collection ~~in approved containers during prescribed times for collection by another party.~~

Commenter's Reason: The proposed revisions to the definition to not include traditional curbside collection of trash as single family homes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal relates to operations in a building and is not associated with any building construction requirements. The Public Comment merely clarifies a definition.

Public Comment# 2905