

# BCAC Related issues from FCAC

## 12/14/20

### WG 1 Passive Fire Protection (Discussed during Nov 19 Joint Meeting)

- 1.4.2 a Occupiable Roof Definition
- 1.4.2 b IBC, IFC –Change Landscaped to Vegetative Roofs
- 1.4.5 Raised Deck Systems

### WG 4.0 Energy Systems (Discussed during Nov 19 Joint Meeting)

- 4.4.1 BIPV Systems
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### WG 5.0 Special Uses (FCAC needs to discuss)

- 5.8.1 Fire protection features distilleries
- 5.9.1 Modular Booth Proposal

## 1.4.2 a Occupiable Roof Definition

### FCAC WG 1.4 – Proposal 1.4-2A

#### IBC - Occupiable Roof Definition

Add new definition as follows:

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

Revise sections as follows:

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

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

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

**503.1.4 ~~Occupied~~ Occupiable roofs.** A roof level or portion thereof shall be permitted to be used as an ~~occupied~~ occupiable roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the ~~occupied~~ occupiable roofs shall not be included in the building area as regulated by Section 506. An ~~occupied~~ occupiable roof shall not be included in the building height or number of stories as regulated by Section 504 provided the penthouses and other enclosed roof structures comply with Section 1510.

#### Exceptions:

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

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

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

**Exception:** Penthouses constructed in accordance with Section 1510.2 and towers, domes, spires and cupolas constructed in accordance with Section 1510.5.

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

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

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

**Exceptions:**

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

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

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

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

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

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

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

7. Exterior exit access stairways and ramps between ~~occupied~~ occupiable roofs.

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

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

1. The *occupant load*, number of *dwelling units* and exit access travel distance do not exceed the values in Table 1006.3.4 (1) or 1006.3.4 (2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.
4. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.
5. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:
  - 5.1. The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.
  - 5.2. Either the *exit* from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the dwelling unit's entrance door provides access to not less than two approved independent *exits*.

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

**Exceptions:**

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

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

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

**1011.12.1 Stairway to elevator equipment.** Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a *stairway*.

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

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

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

**Exceptions:**

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

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

This code proposal both adds a definition for “occupiable roof” and changes terminology throughout the code to be consistent with use of “occupiable roof” rather than “occupied roof”. The definition is intended to parallel the existing code definition for occupiable space:

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

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

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

## BCAC Overlap – Joint due to IFC

### 1.4.2 b IBC, IFC –Change Landscaped to Vegetative Roofs

#### FCAC WG1.4 – Proposal 1.4-2B

IBC, IFC –Change Landscaped to Vegetative Roofs

#### Part I - IFC

Add definition as follows:

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

Revise as follows:

#### **SECTION 317 LANDSCAPED VEGETATIVE ROOFS**

**317.1 General.** ~~Vegetative Landscaped roofs shall comply with be installed and maintained in accordance with Sections 317.2 through 317.5 and Sections 1505 and 1507.16 of the International Building Code and be installed and maintained in accordance with Sections 317,2 through 317.5.~~

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

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

**317.4 Vegetation.** Vegetation shall be maintained in accordance with Sections 317.4.1 and 317.4.2.

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

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

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

**317.5 Maintenance equipment.** Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

**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 as vegetative roofs ~~for landscaped roofs~~ or for other purposes, *stairways* shall be provided as required for such occupancy classification.

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

## FCAC WG1.4 – Proposal 1.4-2B

IBC, IFC –Change Landscaped to Vegetative Roofs

### Part II - IBC

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:

**LIVE LOAD, ROOF.** A load on a roof produced:

1. During maintenance by workers, equipment and materials;
2. During the life of the structure by movable objects such as planters or other similar small decorative appurtenances that are not occupancy related; or
3. By the use and occupancy of the roof such as for vegetative roofs, landscaped roofs or assembly areas.

**[BF] 1505.10 Landscaped Vegetative roofs.** ~~Landscaped Vegetative roofs shall comply with Section Sections 1505.1 and 1507.16 and shall be installed in accordance with ANSI/SPRI VF-1.~~

**1507.16 Vegetative roofs and landscaped roofs.** Vegetative roofs and landscaped roofs shall comply with the requirements of this chapter, Section 1607.13.3 and the International Fire Code.

**1507.16.1 Structural fire resistance.** The structural frame and roof construction supporting the load imposed upon the roof by the vegetative roof or landscaped roofs shall comply with the fire resistance rating requirements of Table 601.

#### **TABLE 1607.1: MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, $L_0$ , AND MINIMUM CONCENTRATED LIVE LOADS**

Item 26 Roofs

Occupiable roofs

Vegetative and landscaped roofs

Table footnote I: Areas of occupiable roofs, other than vegetative and landscaped roofs and assembly areas, shall be designed for appropriate loads as approved by the building official. Unoccupied vegetative and landscaped areas of roofs shall be designed in accordance with Section 1607.13.3.

**1606.3 Vegetative and landscaped roofs.** The weight of all landscaping and hardscaping materials for vegetative and landscaped roofs shall be considered as dead load. The weight shall be computed considering both fully saturated soil and drainage layer materials and fully dry soil and drainage layer materials to determine the most severe load effects on the structure.

**1607.13.3 Vegetative and landscaped roofs.** The uniform design live load in unoccupied vegetative or landscaped areas on roofs shall be 20 psf (0.958 kN/m<sup>2</sup>). The uniform design live load for occupied vegetative or landscaped areas on roofs shall be determined in accordance with Table 1607.1.



**1607.14.2.2 Occupiable roofs.** Areas of roofs that are occupiable, such as vegetative roofs, landscaped roofs, or for assembly or other similar purposes, and marquees, are permitted to have their uniformly distributed live loads reduced in accordance with Section 1607.12.

**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 roofs” is proposed to capture such features and better distinguish between a true “vegetative roof” as defined in the IBC and industry standards.

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

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

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

**Cost Impact:** The proposal will not increase the cost of construction.

The proposal is editorial and will not impact how vegetative roofs are designed and constructed.

## 1.4.5 IBC – Raised Deck Systems

Add new definition to IBC Chapter 2 as follows:

**RAISED-DECK SYSTEM** (For application to Chapter 15 only). A system consisting of decking or pavers supported by pedestals installed over a *roof assembly* to provide a walking surface.

Add new section to IBC Chapter 15 as follows:

**1510.10 Raised-deck systems installed over a roof assembly.** *Raised-deck systems* installed above a *roof assembly* shall comply with Sections 1510.10.1 through 1510.10.5

**1510.10.1 Installation.** The installation of a *raised-deck system* shall comply with all of the following:

1. The perimeter of the *raised-deck system* shall be surrounded on all sides by parapet walls or by a noncombustible enclosure *approved* to prevent fire intrusion below the *raised-deck system*. The parapet wall or enclosure shall extend above the plane of the top surface of the raised deck system.
2. A *raised-deck system* shall be installed above a *listed roof assembly*.

**Exception:** Where the *roof assembly* is not required to have a fire classification in accordance with Section 1505.2

3. A *raised-deck system* shall be installed in accordance with the manufacturer's installation instructions
4. A *raised-deck system* shall not obstruct or block plumbing or mechanical vents, exhaust, or air inlets.

**1510.10.2 Fire classification of the top surface.** The *raised-deck system* shall be tested, *listed* and *labeled* with a fire classification in accordance with Section 1505 of this code for the *roof covering* over which it is installed.

**Exception –** Where the top surface of the raised deck system consists of brick, masonry or concrete materials, no fire test is required.

**1510.10.3 Pedestals or supports.** The pedestals or supports for the *raised deck system* shall be installed in accordance with manufacturer's installation instructions.

**1510.10.4 Structural requirements.** The *raised-deck system* shall be designed for wind loads in accordance with Chapter 16 and Section 1504.4. The *raised-deck system* shall be designed for seismic loads in accordance with Chapter 16.

**1510.10.5 Roof drainage.** The *raised-deck system* shall not impede the operation of the roof drainage system as required by Section 1502 of this code and the *International Plumbing Code*.

**1510.10.6 Access and Egress.** Access to the *raised-deck system* shall be in accordance with Chapter 11 of this code and egress shall be in accordance with Chapter 10 of this code.

**Reason:** Currently the IBC does not have any specific provisions for the design and installation of raised-deck systems. These provisions should be a subsection to Section 1510 because these systems are a roof structure over a roof assembly.

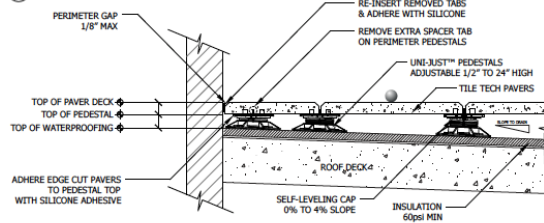
- A definition of “raised deck systems” is needed to ensure correct application of new requirements for these systems. This term is applicable only to Chapter 15 (same “Chapter 15 restriction” as the definition for roof assembly)
- Fire test requirements for the raised deck systems are based on research studies performed for PV panels on low and steep-sloped roofs; which have general applicability to Raised Deck Systems. The following is a link to the reports for those studies:  
<http://www.solarabcs.org/about/publications/reports/flammability-testing/index.html>

These studies showed that when fire was able to enter the space between the roof assembly and the panel above, it could significantly alter the original test results for the fire classification of the roof assembly. By providing a protective barrier at the perimeter such as a parapet wall, roof curb or intersection with vegetative roof to prevent fire intrusion into the space, there would not be any concern with affects to the fire classification of the roof assembly underneath.

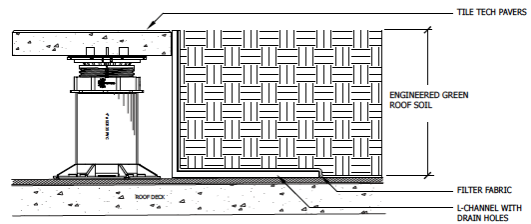
- The manufacturer’s installation instructions cover how the pedestals and supports are to be installed for these systems.
- Three pointers (code references) for structural; roof water drainage; and access and egress are provided to ensure that these other safety and performance requirements essential for roofs are applied to Raised Deck Systems.
- The following is an example of what a typical raised deck system is:



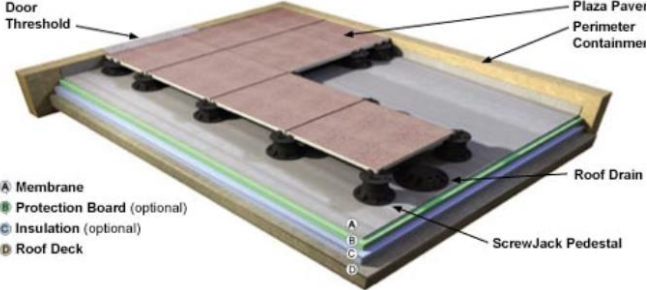
**AI CORNER PEDESTAL APPLICATION - SECTION DETAILS**



**GREEN ROOF CONTAINMENT**



**LEVEL SYSTEM**



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

Will increase the cost of construction, for those who decide to install these types of systems. However, this provides clarity on what requirements are to be applied for these installations.

## 4.4.1 BIPV Systems

### 1. PROPOSAL – BIPV systems

Revise the definition in Chapter 2 of the IBC as follows:

[BS] BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) **PRODUCT SYSTEM**. A building **product system** that incorporates photovoltaic modules and functions as **a an integral part component** of the building envelope, **such as roof assemblies and roof coverings, exterior walls and exterior wall cladding, and fenestration.**

Also revise Section 1505.8 in the IBC as follows:

[BF] 1505.8 Building-integrated photovoltaic (BIPV) **products systems**. BIPV **products systems** installed as the roof covering **or roof assembly** shall be tested, *listed* and *labeled* for fire classification in accordance with Section 1505.1.

**REASON:** The term “BIPV product” is used twice in the I-codes, both requiring fire classification for roofing applications (IBC Section 1505.8 and IRC Section R902.3). The term “BIPV system” is used four times in the I-codes, addressing roof access, rapid shutdown systems, and fire classification for roofing applications (IBC Sections 1205.2, 1205.2.3, 3111.3.2, 3113.3). IBC Section 3111.3.2 directs BIPV systems to have a fire classification in accordance with Section 1505.8. The word “system” is defined by the dictionary as “a combination of things or parts forming a complex or unitary whole”, whereas the word “product” is defined as “the totality of goods or services that a company makes available; something produced”. “Product” infers a discrete piece, whereas “system” better describes a number of components that when installed function together for a specific purpose. This proposal also clarifies that these systems, when installed per the manufacturer’s installation instructions, become an integral part of the building envelope to provide a physical separator between internal and external environments.

**COST IMPACT STATEMENT:** This code change proposal will not increase or decrease the cost of construction. This proposal clarifies the term as it is used in the codes.

## 4.4.2 Solar Energy Systems - partially Group B IRC

### 2. PROPOSAL – Solar energy systems

Revise the following definition to Chapter 2 of the IRC

**SOLAR ENERGY SYSTEM.** A system that converts solar radiation to usable energy, including photovoltaic ~~panel~~ systems and *solar thermal systems*.

Add the following definition to Chapter 2 of the IBC

**[BG] SOLAR ENERGY SYSTEM.** A system that converts solar radiation to usable energy, including photovoltaic systems and *solar thermal systems*.

**REASON:** The term “solar energy system” is used in several locations in IBC Section 3111 and IRC Section R324. By including the same definition of this term in both the IBC and IRC promotes consistency. This definition currently is only in Chapter 2 of the IRC, but includes an unnecessary limitation to just PV panel systems. PV panel system is one type of PV system. This change would be inclusive of all types of PV.

**COST IMPACT STATEMENT:** This code change proposal will not increase or decrease the cost of construction. This proposal clarifies what is covered by the requirements for solar energy systems.

## 5.8.1 Fire Protection Requirements

F276-18 (AS)

### CHAPTER 40

#### STORAGE OF DISTILLED SPIRITS AND WINES

**User note:**

*About this chapter: Chapter 40 provides requirements for the storage of distilled spirits and wines.*

\*\*\*MORE TEXT TO BE ADDED\*\*\*

#### SECTION 4001

##### GENERAL

**4001.1 General.** The storage of distilled spirits and wine in barrels and casks shall comply with this chapter in addition to other applicable requirements of this code.

**4001.1.1 Nonapplicability.** When storage of distilled spirits is compliant with this chapter, Chapter 50 and Chapter 57 of this code are not applicable to the storage of distilled spirits and wines in barrels and casks as identified in Section 5001.1, Exception 10, and Section 5701.2, Item 10.

#### SECTION 4002

##### DEFINITIONS

**4002.1 Terms defined in Chapter 2.** Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

**SECTION 4003**  
**PRECAUTIONS AGAINST FIRE**

**4003.1 Spill Control.** Drainage or containment systems shall be provided by means of curbs, scuppers, special drains, or other suitable means to prevent the flow of spills throughout the building.

**4003.2 Ventilation.** Ventilation shall be provided for rooms and spaces where distilled spirits and wines in barrels and casks are stored in accordance with the International Mechanical Code and one of the following:

1. The rooms and spaces shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25% of the LFL. This shall be confirmed by sampling of the actual vapor concentration under normal operating conditions. The sampling shall be conducted throughout the enclosed storage area extending to or toward the bottom and the top of the enclosed storage area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure. The sampling shall be conducted manually or by installation of a continuously monitoring flammable vapor detection system.
2. The rooms and spaces shall be provided exhaust ventilation at a rate of not less than 1 cfm/ft<sup>2</sup> (0.3 m<sup>3</sup>/min) of solid floor area. The exhaust ventilation shall be accomplished by natural or mechanical means, with discharge of the exhaust to a safe location outside the building.

**4003.3 Sources of ignition.** Sources of ignition shall be controlled in accordance with Sections 4003.3.1 through 4003.4.

**4003.3.1 Smoking.** Smoking shall be prohibited and "No Smoking" signs provided as follows:

1. In rooms or areas where hazardous materials are stored or dispensed or used in open systems in amounts requiring a permit in accordance with Section 105.6 and 105.7
2. Within 25 feet (7620mm) of outdoor storage, dispensing or open use areas.
3. Facility or areas within facilities that have been designated as totally "no smoking" shall have "No Smoking" signs placed at all entrances to the facility or area. Designated areas within such facilities where smoking is permitted either permanently or temporarily shall be identified with signs designating that smoking is permitted in these areas only.



4. In rooms or areas where flammable or combustible hazardous materials are stored, dispensed or used. Signs required by this section shall be in English as a primary language or in symbols allowed by this code and shall comply with Section 310.

**4003.3.2 Open Flame.** Open flames and high-temperature devices shall not be used in a manner that creates a hazardous condition and shall be listed for use with the hazardous materials stored or used.

**4003.3.3 Industrial trucks.** 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.

**4003.3.4 Electrical.** Electrical wiring and equipment shall be installed and maintained in accordance with Section 605 and NFPA 70.

**4003.4 Lightning.** Structures containing barrel storage should be protected from lightning. The lightning protection equipment shall be installed in accordance with NFPA 780 and NFPA 70.

## **SECTION 4004**

### **STORAGE**

**4004.1 Storage.** Storage shall be in accordance with this section and Section 315.

**4004.2 Empty containers.** The storage of empty containers previously used for the storage of flammable or combustible liquids, unless free from explosive vapors, shall be stored as required for filled containers.

**4004.3 Basement storage.** Class I liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity over control area for use-open systems in Table 5003.1.1(1), provided that automatic suppression and other fire protection are provided in accordance with Chapter 9. Class II and IIIA liquids shall also be allowed to be stored in

basements, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

**4004.4 Bulk beverage storage areas.** There shall be no storage of combustible materials in the bulk beverage storage areas not related to the beverage storage activities.

## SECTION 4005

### FIRE PROTECTION

~~**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.~~

**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 amended 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 space.** 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 options:

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, or
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 Sprinkler system design.** Storage heights and sprinkler densities for palletized on-end barrels shall in accordance with Table 4005.1.4 and Sections 4005.1.4.1 through 4005.1.4.6.

**4005.1.4.1 Protected product.** The storage and sprinkler requirements in Table 4005.1.4 apply to alcohol-water mixtures greater than 20% and up to 75% alcohol by volume in wooden barrel sizes not exceeding 130 gallons (492 L).

**4005.1.4.2 Hose stream allowance.** The sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

**4005.1.4.3 Water supply duration.** The sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

**4005.1.4.4 Sprinkler system balancing.** Where a permanent loading aisle is provided with a separate ceiling sprinkler system, the barrel storage sprinkler design and the loading aisle 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.

**Table 4005.1.4**

**Palletized Storage of Distilled Spirits with up to 75% Alcohol by Volume in Wooden Barrels**

<u>Protection Area</u>	<u>Sprinkler System Type</u>	<u>Maximum Ceiling Height (feet)</u>	<u>Maximum Storage Height</u>	<u>Ceiling Sprinkler Protection</u>	<u>K-factor gpm/psi<sup>1/2</sup></u>	<u>Design <sup>a</sup>, # of Sprinklers @ Pressure (psi)</u>
				<u>Response / Nominal Temperature Rating / Orientation</u>		
<u>Barrel Storage</u>	<u>Wet-pipe</u>	<u>30</u>	<u>24 feet or 7 barrels</u>	<u>QR / 165°F / Pendent</u>	<u>14.0</u>	<u>12 @ 18</u>
	<u>Dry-pipe</u>			<u>SR / 286°F / Upright</u>	<u>16.8</u>	<u>24 @ 13</u>
	<u>Wet-pipe</u>	<u>30</u>	<u>1 barrel</u>	<u>Any / 165°F / Any</u>	<u>11.2</u>	<u>30 @ 7</u>
	<u>Dry-pipe</u>			<u>SR / 286°F / Upright</u>	<u>11.2</u>	<u>50 @ 7</u>
	<u>Wet-pipe</u>	<u>30</u>	<u>2 barrels</u>	<u>SR / 286°F / Any</u>	<u>11.2</u>	<u>50 @ 29</u>
<u>Loading Aisle w/ Draft Curtain</u>	<u>Wet-pipe or Dry-pipe</u>	<u>30</u>	<u>NA</u>	<u>SR / 286°F / Any</u>	<u>5.6</u>	<u>100 @ 13</u>
					<u>&gt; 8.0</u>	<u>100 @ 7</u>
<u>Loading Aisle w/ Trench Drains or Banded Barrels or No Permanent Loading Aisle</u>	<u>Provide the barrel storage design across the entire roof area (i.e., storage area and loading aisle)</u>					

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi<sup>0.5</sup> = 14.395 L/min/bar<sup>0.5</sup>;

$^{\circ}\text{C} = [(\text{F}) - 32] / 1.8.$

Notes: QR = quick response sprinkler; SR = standard response sprinkler.

- a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m<sup>2</sup>).

**4005.1.4.6 Small distilled spirits facilities.** Fire protection for palletized storage of distilled spirits in small distilled spirits facilities are permitted to be in accordance with Sections 4005.1.4.6.1 through 4005.1.4.6.3 provided area of the facility does not exceed 7,500 square feet (697 m<sup>2</sup>).

**4005.1.4.6.1 Ceiling clearance.** The clearance from the top of storage to the deflector of the ceiling sprinklers shall be a minimum of 18 inches (457 mm) and a maximum of 10 feet (3048 mm).

**4005.1.4.6.2 Sprinkler coverage area.** The sprinkler coverage area shall not exceed 80 square feet (7.4 m<sup>2</sup>) per sprinkler.

**4005.1.4.6.3 Fire protection scheme.** The storage arrangement and automatic sprinkler system design shall comply 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**

<b>Protection Area</b>	<b>Sprinkler System Type</b>	<b>Maximum Ceiling Height (feet)</b>	<b>Maximum Storage Height (feet)</b>	<b>Ceiling Sprinkler Protection</b>			
				<b>Response / Temperature Rating / Orientation</b>	<b>K-factor (gpm/psi<sup>1/2</sup>)</b>	<b>Sprinkler Density (gpm/ft<sup>2</sup>)</b>	<b>Area (square feet)</b>
Barrel Storage	Wet-pipe	24	12	SR / 286°F / Any	≥ 11.2	0.35	4000
				SR / 165°F / 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/psi<sup>0.5</sup> = 14.395 L/min/bar<sup>0.5</sup>;

°C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m<sup>2</sup>.

Notes: SR = standard response sprinkler.

**4005.2 Rack storage of distilled spirits in wooden barrels.** The rack storage of distilled spirits 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 of in accordance with one of the following:

1. Using noncombustible materials that are 50% open.
2. Using noncombustible materials that are open less than 50% 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. Using combustible materials and provided with a row of sprinklers directly beneath.

**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 shall be protected in accordance with Table 4005.2.3 and Sections 4005.2.3.1 through 4005.2.3.5.2.

**4005.2.3.1 Protected product.** The storage and sprinkler requirements in Table 4005.2.3 apply to alcohol-water mixtures up to 75% alcohol in wooden barrel sizes not exceeding 130 gallons (492 L).

**4005.2.3.2 Hose stream allowance.** The sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

**4005.2.3.3 Water supply duration.** The sprinkler system water supply duration, including hose stream demand, shall be a minimum of one hour.

**4005.2.3.4 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.

**4005.2.3.5 In-rack sprinklers.** Rack storage heights not exceeding 33 feet (10 058 mm) or 9 barrels shall be provided with a single level of in-rack sprinklers below the top level of storage in accordance with **Figures D.2.1.48 and D.2.1.49** and Table 4005.2.3.

**4005.2.3.5.1 Ceiling sprinkler system.** The ceiling sprinkler system shall be designed with a minimum density of 0.2 gallons per minute per square foot (0.8 L/min) over 2000 square feet (186 m<sup>2</sup>).

**4005.2.3.5.2 Sprinkler system balancing.** The ceiling sprinkler system and the in-rack sprinkler system shall be balanced at the point of connection.

**Table 4005.2.3**

**Rack Storage of Distilled Spirits in Wooden Barrels**

<u>Barrel Arrangement</u>	<u>Sprinkler System Type</u>	<u>Maximum Ceiling Height (feet)</u>	<u>Maximum Storage Height</u>	<u>Minimum Aisle Width (feet)</u>	<u>Ceiling Sprinkler Protection</u>			<u>In-Rack Sprinkler Protection</u>			
					<u>Response / Nominal Temperature Rating / Orientation</u>	<u>K-factor (gpm/psi<sup>1/2</sup>)</u>	<u>Design, # of Sprinklers @ Pressure (psi)</u>	<u>Layout</u>	<u>Response / Nominal Temperature Rating</u>	<u>K-factor (gpm/psi<sup>1/2</sup>)</u>	<u>Design<sup>a</sup>, # of Sprinklers @ Pressure (psi)</u>
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	Fig D.2.1.48 and D.2.1.49	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	Fig D.2.1.48 and D.2.1.49	QR / 165°F / Upright	8.0 (115)	6 @ 45 [one level of in racks] Or 12 @ 45 [more than one level of in-racks]

<u>On-End</u>	<u>Wet</u>	<u>30</u>	<u>25 feet / 5 barrels</u>	<u>8</u>	<u>SR / 286°F / Any</u>	<u>≥ 11.2</u>	<u>50 @ 7</u>	<u>Fig D.2.1.4, D.2.1.6, D.2.1.7, D.2.1.8</u>	<u>QR / 165°F / Any</u>	<u>≥ 8.0 (115)</u>	<u>6 @ 25 [one level] or 12 @ 25 [more than one level of in-racks]</u>
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For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi<sup>0.5</sup> = 14.395 L/min/bar<sup>0.5</sup>;

°C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m<sup>2</sup>.

Notes: QR – quick response sprinkler; SR – standard response sprinkler.

- a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m<sup>2</sup>).

**4005.3 Wine 20 percent or less alcohol content.** The storage of wine in barrels with an alcohol content of 20% or less of alcohol shall be protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1.

**4005.2-4 Portable fire extinguishers.** Approved portable fire extinguishers shall be provided in accordance with Section 906.

## SECTION 4006

### SIGNAGE

**4006.1 Hazard identification signs.** Unless otherwise exempted by the fire code official, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary containers and above ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the fire code official.

**4006.1.1 Maintenance and style.** Signs and markings required by Section 4006.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color, and lettering shall be approved.



# IBC

**[F] 307.1 High-hazard Group H.** High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in *control areas* complying with Section 414, based on the maximum allowable quantity limits for *control areas* set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*. Hazardous materials stored, or used on top of roofs or canopies, shall be classified as outdoor storage or use and shall comply with the *International Fire Code*.

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

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

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

**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:

Beverages: over 20-percent ~~16-percent~~ alcohol content

**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-percent ~~16-percent~~ alcohol content

**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:

Beverages over 20-percent ~~16-percent~~ alcohol content

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

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

Beverages up to and including 20-percent ~~16-percent~~ alcohol content

## 5.9.1 Modular Booth Proposal – Joint with FCAC

### **New Section 202 definition (both IBC and IFC – definitions scoped to IBC General committee):**

**MODULAR BOOTH.** An occupiable prefabricated enclosed space 16. Sq. ft. or less consisting of walls and a ceiling, with or without an integrated floor, which is intended for indoor use, and may include integral electrical wiring and furnishings.

**MODULAR ROOM.** An occupiable prefabricated enclosed space greater than 16 square feet, with or without an integrated floor, or furnishings, designed and manufactured for use as an office, or privacy space, which is equipped with *means of egress, lighting and ventilation, and* fire protection features. These are also known as “room in room”.

**SLEEP POD.** A modular booth or modular room that is designed and used for sleeping purposes.

### **New IFC Section 320**

#### **320 MODULAR BOOTHS, MODULAR ROOMS, and SLEEP PODS**

**320.1 General.** Modular booths, modular rooms, and sleep pods installed inside occupancies covered by this code shall comply with Section 429 of the *International Building Code*.

### **New IBC Section 429**

#### **SECTION 429**

#### **MODULAR BOOTHS, MODULAR ROOMS, and SLEEP PODS**

**429.1 General.** Modular booths, modular rooms, and sleep pods installed inside occupancies covered by this code shall comply with Sections 429.2 through 429.8.

Sleep pods shall comply with section 429.2 through 429.9.

**429.2 Size limitations.** Modular rooms shall not exceed 100 sq. feet (9.3 m<sup>2</sup>) in floor area and 8 feet (2438 mm) in height.

**Exception:** Prefabricated structures in excess of these dimensions shall comply with applicable construction requirements in this code.

**429.3 Listing.** Modular rooms, modular booths, and sleep pods shall be listed and labeled in accordance with UL 962 and installed in accordance with the listing and the manufacturer’s installation instructions.

**429.4 Interior finish.** Finish materials on the interior and exterior surfaces of modular booths, modular rooms and sleep pods shall comply with the applicable requirements in Chapter 8 of this code and the International Fire Code.

**429.5 Plastics.** Plastics materials used in floor, wall, and ceiling construction shall comply with the applicable requirements in Chapter 26 of this code.

**429.6 Locations.** Modular booths, modular rooms and sleep pods shall be installed in approved locations and shall not obstruct required means of egress.

**429.7 Automatic fire suppression.** An automatic fire sprinkler system shall be installed within modular rooms and sleep pods in accordance with Section 903.3.1.1 or 903.3.1.2.

**Exception:** An automatic fire sprinkler system is not required for any of the following.

1. Modular rooms installed in a building not requiring an automatic sprinkler system.
2. Within modular rooms and sleep pods where fire sprinklers are permitted to be omitted in accordance with Section 903.3.1.1 or 903.3.1.2.

**429.7.1. Sprinkler Clearance.** A clearance of not less than a 3-foot (914 mm) shall be maintained below the building's automatic fire sprinklers and above the top of the modular booths, modular rooms, or sleep pods.

**Exception:** Clearance shall not be required when automatic sprinkler suppression is provided within the booth, room, or pod.

**429.8 Fire detection and annunciation.** Automatic fire detection and alarm notification appliances shall be provided in modular rooms, modular booths, and sleep pods in accordance with Section 907.2. Automatic smoke detection that activates the occupant notification system shall be installed in all of the following locations.

1. Common spaces outside of sleep pods.
2. All interior corridors serving sleep pods.
3. Where required by the building official automatic fire detection and automatic notification appliances, interconnected to the buildings fire alarm system, shall be provided within the sleep pod.

**429.9 Egress.** Modular booths and modular rooms shall comply with Chapter 10 of this code.

**Exception:** Modular booths and modular rooms not required to be an accessible space in accordance with Chapter 11 shall be permitted to have an elevation change measured from the finished floor that is a maximum of 5 inches (127 mm) higher than the floor of the existing structure outside the modular room or modular booth provided a sign is installed on each side of the door warning about the elevation change, and a distinctive marking stripe is installed across the threshold having a width of not less than 1 inch (25 mm) but not more than 2 inches (51 mm).

**429.10 Sleep pods.** *Sleep pods* shall also comply with the following:

1. Individual *sleep pods* shall not exceed 16 sq. feet (3.3 m<sup>2</sup>) in floor area, 8 feet (2438 mm) in height and 4 ft (1219 mm) in width.

**Exception:** *Sleep pods* provided with automatic fire sprinklers within each individual sleep pod.

2. *Sleep pods* shall only be permitted for use in *fire areas* which are provided with an *automatic fire sprinkler system* installed in accordance with Section 903.3.

3. Where building smoke detection is not required to be installed within the *sleep pod* in accordance with Section 429.8, single or multiple station smoke alarms shall be installed in each individual sleep pod in accordance with Section 907.2.10.

4. Where *approved* by the *building official*, *sleep pods* shall be permitted to be installed in other than Group R and Group I occupancies.

5. The total number of *sleep pods* installed in a single *fire area* shall not to exceed 10 percent of the *fire area* of the *story* in which they are located.

**Exception:** where a special investigation, acceptable to the *building official*, has demonstrated adequate fire safety.

6. *Sleep pods* shall only be stacked when allowed by the manufacturer's instructions and their listing.

7. Where multiple sleep pods are grouped together, a maximum of four *sleep pods* cumulatively shall be placed adjacent to one another in any one group. There shall be a minimum of 10 feet horizontal separation to additional groups of *sleep pods* provided.

**Exceptions:**

1. *Groups of sleep pods* provided with an *automatic sprinkler system* within each individual sleep pod.
2. *Groups of sleep pods* separated by a one hour rated fire barrier in accordance with Section 707.
3. A special investigation, acceptable to the *building official*, has demonstrated adequate fire safety.

**Reason:**

This proposal covers limited size modular booths, rooms, and sleeping pods, such as those shown below. These booths rooms, and sleeping pods are being treated as products that can be installed in a building, and not as building construction. Specific requirements address the following:

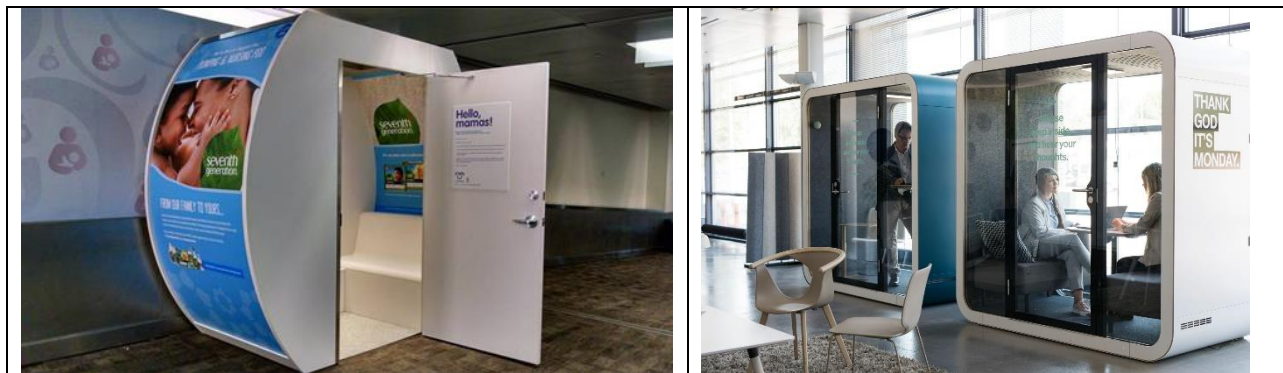
The UL 962 listing will cover the safety of the modular booth, rooms, and sleeping pods, and internal wiring devices and other construction. Among other things the listing evaluates the safety of the internal wiring, plumbing and other construction features.

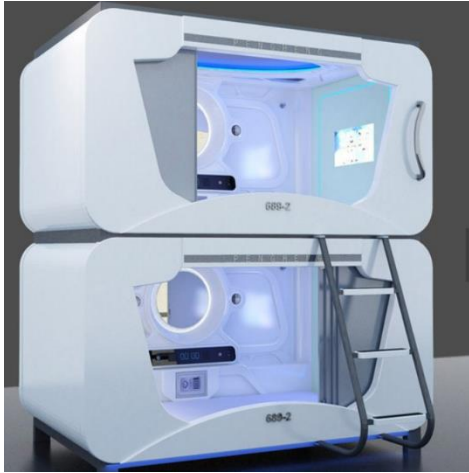
The code official can approve the locations in which, modular rooms, booths and sleeping pods, is to be installed, which allows the flexibility to take into consideration the occupancy in which the modular booth, rooms, and sleeping pods, is to be installed, the size of the booth, rooms, and sleeping pods, and it's features and intended usage.

The modular room is required to be located so that spacings to automatic sprinklers are maintained, the building official is given the authority to not require automatic suppression within the modular rooms in excess of 4 ft in width if allowed by NFPA 13.

This proposal also covers sleep pods, a type of modular room, that are showing up on more occupancies such as airports and office buildings. The proposal allows the code official the authority to approve the installation of sleep pods in specific locations, and the number of sleep pods to be installed. Minimum safety requirements are also required for these pods.

In addition to the requirements proposed for this section, the code official can also apply other code requirements related to the installation of the product, such as obstructions to the means of egress or automatic detection connected to the buildings alarm system.





**Cost Impact:** The cost of these construction should not increase significantly if Listed, since there is a safety standard for these types of products.



