



# IBC®

INTERNATIONAL  
BUILDING

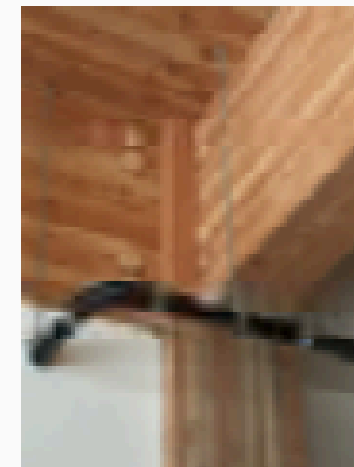
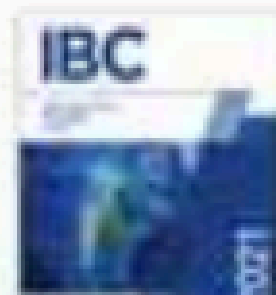
International Code Family®

# **2021 IBC** **SIGNIFICANT** **NONSTRUCTURAL** **CHANGES**



## 110.3.5 Type IV Connection Protection

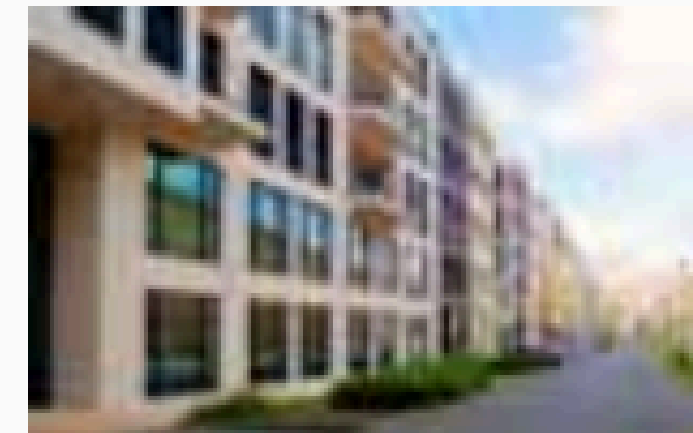
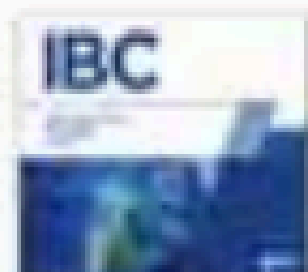
- Where mass timber connection fire-resistance ratings are provided by wood cover, inspection of the wood cover is required.
  - Inspection to occur after cover is installed but before other coverings or finishes are in place.
- Special inspection is not required, as the review of protection is consistent with other tasks of building department personnel.
- Typical protection to include the overlay of additional wood cover by:
  - Oversizing structural element, or
  - Addition of a collar or other architectural embellishment at the connection.





## 110.3.7 Inspection of Weather-Exposed Balconies

- Scope of the required waterproofing inspection of balconies and similar elevated walking surfaces that are exposed to water has been modified.
- Waterproofing inspection is now specifically limited to surfaces that are “weather-exposed.”
- Defined term “weather-exposed surfaces” is:
  - Limited to water, snow and similar elements that are weather-related (deletes irrigation water).
  - Prescriptively established as covered areas not significantly set back from the edge of the overhead projection (in general, at least twice the clear height under the projection).



# 202 Definition of Atrium

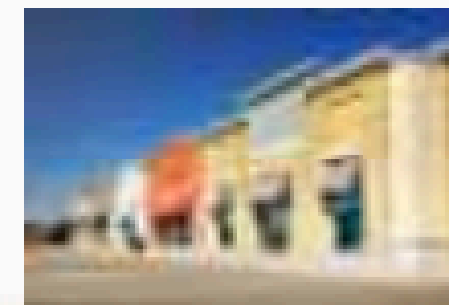
- Atrium definition has been simplified to address only two conditions:
  - Vertical space enclosed at the top, and
  - Connects three or more stories in all occupancies other than Groups I-2 and I-3 (two stories).
- Other text has been deleted or relocated to Chapter 7.
- Primary significance is increase of threshold from two to three stories for most occupancies, however no change in application will typically occur.
- Intended result is to eliminate confusion with allowance in Section 712.9 permitting two-story opening conditions without regulation as an atrium.





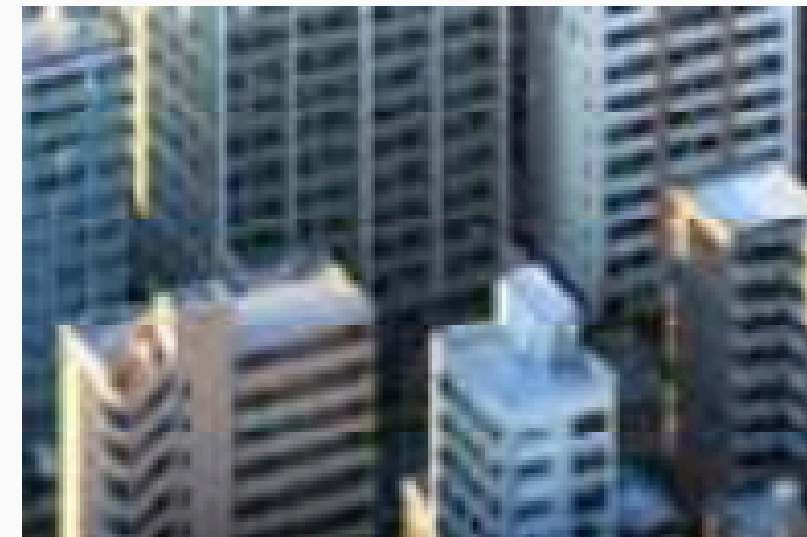
# 202 Definition of Change of Occupancy

- Change of occupancy now occurs where code requires a greater degree of safety, accessibility, structural strength, fire protection, means of egress, ventilation or sanitation than exists in current building.
- Applies where there is a change in:
  - Occupancy classification, or
  - Purpose or level of activity.
- Previously, a change in occupancy occurred if there was a change in application of the code requirements.
  - Did not limit the areas of code addressed or that it only applied where a higher risk to life safety or occupant welfare occurred.



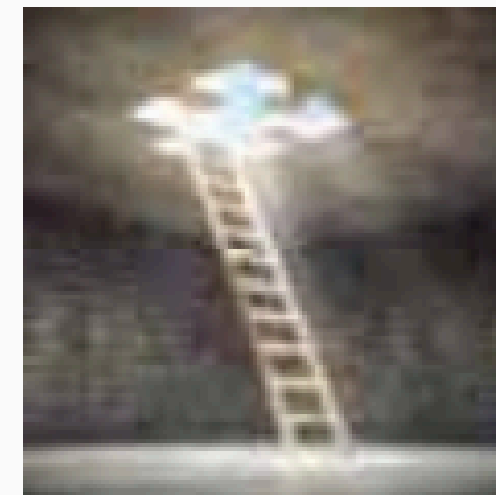
# 202 Definition of Penthouse

- Definition revised to clarify that enclosures extended to the roof to house stairways are to be considered as penthouses as regulated in Section 1511.
  - Previously, intended to be included in reference to “vertical shaft openings”
- Confirms that extension of stair enclosure above roof level is to be considered as a portion of the story directly below the roof deck below, and does not create:
  - An additional story
  - Additional building area
  - Additional fire area
  - Additional building height
    - Subject to limitations



## 202 Definition of Puzzle Room

- Puzzle room is a new defined term that is most commonly recognized as an “escape room.”
- In a puzzle room, occupants are encouraged to solve a challenge to escape from a room or, more commonly, a series of rooms.
- Of particular importance is the recognition by the definition that a puzzle room is considered as a “special amusement area” (formerly special amusement building).
  - Special amusement areas continue to be specifically regulated under provisions of Section 411.





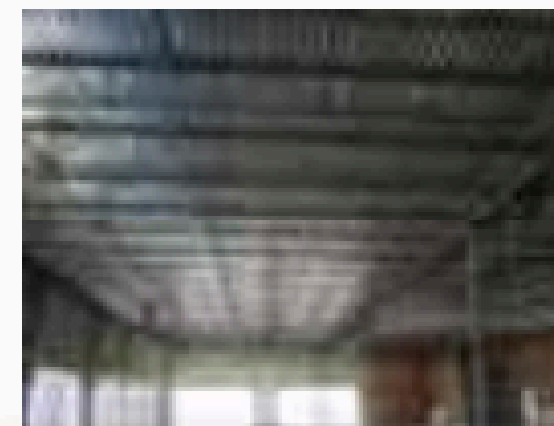
# 202 Definition of Structural Members

- Clarifications in the definitions of “primary” and “secondary” structural members intended to:
  - Address new technologies, and
  - Remove archaic terminology and redundant language
- Type and level of protection for various structural elements varies in Table 601 and Section 704 depending on the:
  - Member under consideration, and
  - Portion of structural system where it is located.
- Revisions help address newer structural systems, such as:
  - Mass timber with only CLT floor and wall panels with no columns, and
  - Concrete slab floor systems where slabs connect directly to columns.



# 202 Definition of Structural Members

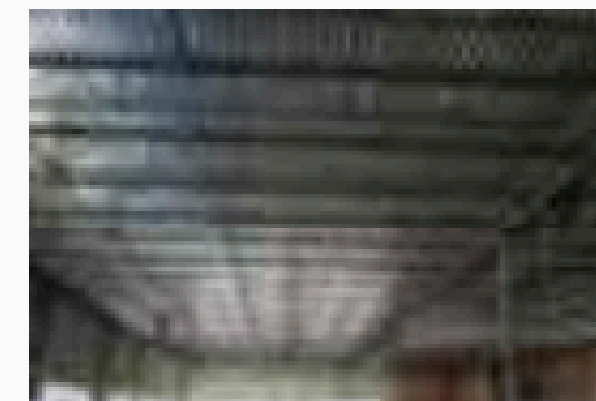
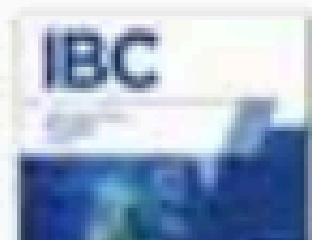
- Any member or component essential to vertical stability of building under gravity loads now to be classified and protected as part of the **primary structural frame**, including:
  - Columns
  - Beams and girder trusses – directly supported by columns
  - Roof and floor panels and slabs – monolithic concrete and timber construction
  - Braced frames and moment frames – transfer gravity loads to the foundation
  - Bearing walls – support gravity loads and transfer them to the foundation



center

# 202 Definition of Structural Members

- Components built into an assembly that supports a portion of a floor, roof or only their own self-weight are considered as **secondary members**, including:
  - Roof trusses connected to a girder truss
  - Roof purlins and subpurlins connect to beams
  - Floor joists and trusses
  - Nonbearing walls
  - Bracing in the roof, floor or walls specifically designed to resist wind or seismic loads and is redundant for gravity systems.





# 202 Definition of Structural Members



Floor construction considered as primary structural frame members



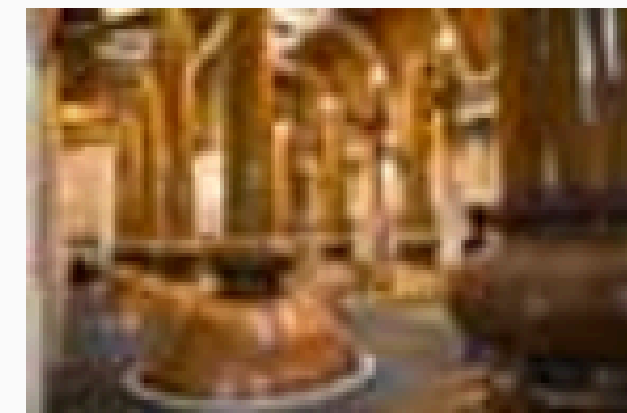
Floor construction considered as secondary structural members



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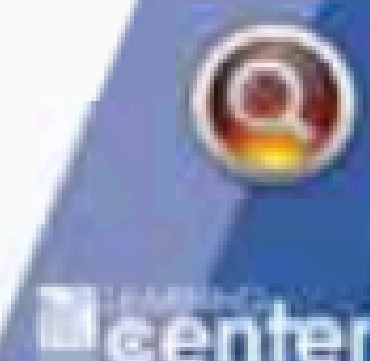
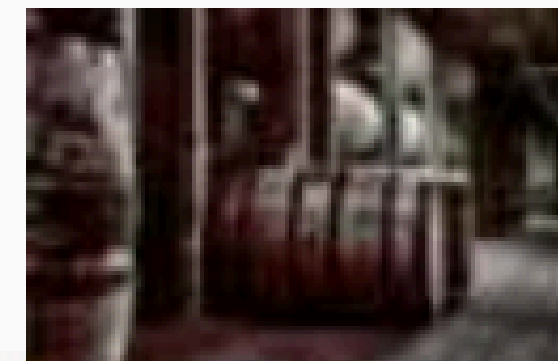
# 307.1.1 Uses Not Classified as Group H

- Two new items have been added to the list of uses that store, use and/or handle hazardous materials but are not to be classified as Group H.
  - Distilling or brewing of alcohol beverages
  - Storage of beer, distilled spirits and wines in barrels and casks
- Removal of Group H status applicable regardless of alcohol content and quantity of liquid.
- IFC has added additional requirements to address hazards, including automatic sprinkler systems in Group F-1 and S-1 fire areas where such liquids are located.



# 311.2, 311.3 Alcoholic Beverage Storage

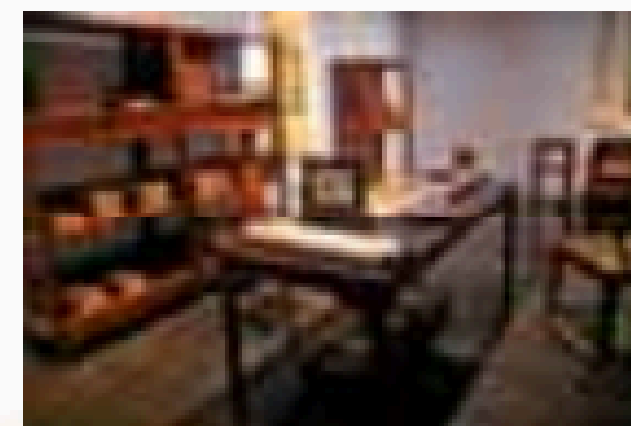
- Storage of alcoholic beverages with over 16% alcohol content now classified as Group S-1 occupancy.
  - Previously not specifically addressed.
- Where alcohol content does not exceed 16%, classification continues to be Group S-2.
  - Limit that containers be only metal, glass or ceramic has been deleted to allow for wooden barrels and casks.
  - IFC safeguards no longer warrant restriction to only noncombustible containers.
- New 2021 IFC Chapter 40 applicable solely to storage of distilled spirits and wine





# 411.5 Puzzle Rooms

- Puzzle rooms now regulated as special amusement areas, requiring compliance with all fire- and life-safety provisions of Section 411.
- In addition, special exiting requirements have been added to solely address puzzle rooms:
  - Per Chapter 10, or
  - Alternate design approved by building official, or
  - Exit to be open and readily available upon activation by fire alarm system, sprinkler system, or manual control at constantly attended location.



# 411.5 Puzzle Rooms

- Puzzle rooms, as well as all other special amusement areas, must meet the following previously-established criteria:
  - Classified as Group A or B occupancy, based upon occupant load.
  - Fire protection systems required, including:
    - Automatic sprinkler system (with exception)
    - Automatic smoke detection system
    - Emergency voice/alarm communication system
  - Special exit marking, including approved directional marking.
  - Class A interior finishes.



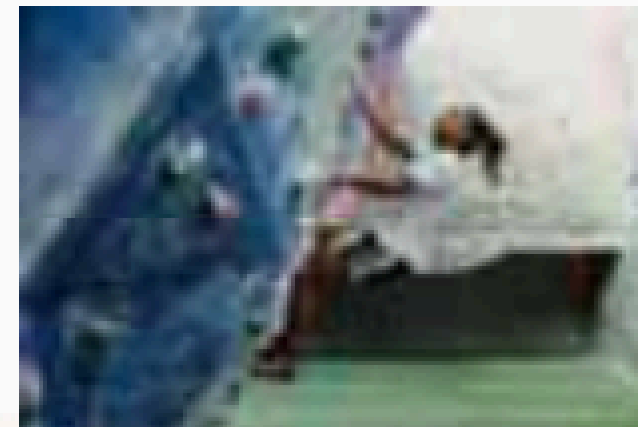
## 414.2.3 Fire Wall Use for Control Areas

- For purposes of determining the number of control areas in a building, each portion separated by one or more fire walls shall be considered a separate building.
- Previously, the “separate building” allowance has been limited to allowable area, allowable height and type of construction



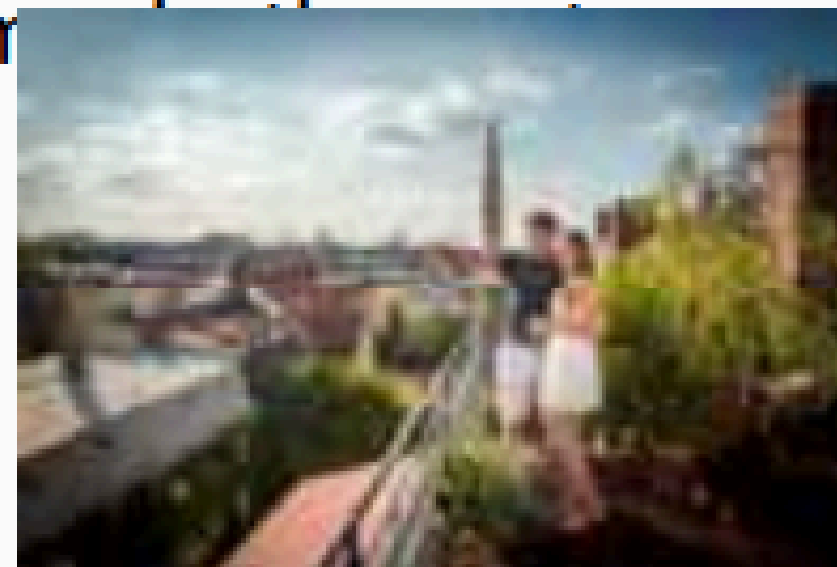
# 424 Play Structures

- No longer limited to structures used solely by children, such as climbing walls.
- New requirements for structures more than 600 square feet in area or more than 10 feet in height:
  - Interior finishes per Table 803.13
  - Designed in accordance with Chapter 16
- Special investigation to demonstrate adequate fire safety now required where area of play structure exceeds 600 square feet.
  - Previously required when greater than 300 square feet in area.



## 503.1.4 Occupied Roof Allowances

- Further clarification indicates that an occupied roof is not to be included in the building height or number of stories.
  - Any roof structures to comply with Section 1511 for penthouses and other enclosed rooftop structures.
- Where occupancy on roof not limited, occupant notification to be provided at the roof level where alarm system is required elsewhere in the building.
- Such notification applicable to:
  - Audible alarms
  - Emergency voice/alarm communication
  - Visual alarms



## 508.4.4 Separated Occupancies

- Format change to Table 508.4 addressing separated occupancies provides greater clarity and functionality.
- Previous lack of entries in matrix caused unnecessary confusion.
- All cells of Table 508.4 now contain the minimum required fire-resistance-rated occupancy separation to be applied when the separated occupancies method is applied.
- Revision is simply a format change, with no change in technical requirements.



**TABLE 508.4**  
**REQUIRED SEPARATION OF OCCUPANCIES (HOURS)<sup>f</sup>**

| OCCUPANCY                    | A, E |    | I-1 <sup>a</sup> , I-3, I-4 |    | I-2 |    | R <sup>a</sup> |                | F-2, S-2 <sup>b</sup> , U |                | B <sup>c</sup> , F-1, M, S-1 |    | H-1 |    | H-2 |    | H-3, H-4       |    | H-5 |    |
|------------------------------|------|----|-----------------------------|----|-----|----|----------------|----------------|---------------------------|----------------|------------------------------|----|-----|----|-----|----|----------------|----|-----|----|
|                              | S    | NS | S                           | NS | S   | NS | S              | NS             | S                         | NS             | S                            | NS | S   | NS | S   | NS | S              | NS | S   | NS |
| A, E                         | N    | N  | 1                           | 2  | 2   | NP | 1              | 2              | N                         | 1              | 1                            | 2  | NP  | NP | 3   | 4  | 2              | 3  | 2   | NP |
| I-1 <sup>a</sup> , I-3, I-4  | 1    | 2  | N                           | N  | 2   | NP | 1              | NP             | 1                         | 2              | 1                            | 2  | NP  | NP | 3   | NP | 2              | NP | 2   | NP |
| I-2                          | 2    | NP | 2                           | NP | N   | N  | 2              | NP             | 2                         | NP             | 2                            | NP | NP  | NP | 3   | NP | 2              | NP | 2   | NP |
| R <sup>a</sup>               | 1    | 2  | 1                           | NP | 2   | NP | N              | N              | 1 <sup>c</sup>            | 2 <sup>c</sup> | 1                            | 2  | NP  | NP | 3   | NP | 2              | NP | 2   | NP |
| F-2, S-2 <sup>b</sup> , U    | N    | 1  | 1                           | 2  | 2   | NP | 1 <sup>c</sup> | 2 <sup>c</sup> | N                         | N              | 1                            | 2  | NP  | NP | 3   | 4  | 2              | 3  | 2   | NP |
| B <sup>c</sup> , F-1, M, S-1 | 1    | 2  | 1                           | 2  | 2   | NP | 1              | 2              | 1                         | 2              | N                            | N  | NP  | NP | 2   | 3  | 1              | 2  | 1   | NP |
| H-1                          | NP   | NP | NP                          | NP | NP  | NP | NP             | NP             | NP                        | NP             | NP                           | NP | N   | NP | NP  | NP | NP             | NP | NP  | NP |
| H-2                          | 3    | 4  | 3                           | NP | 3   | NP | 3              | NP             | 3                         | 4              | 2                            | 3  | NP  | NP | N   | NP | 1              | NP | 1   | NP |
| H-3, H-4                     | 2    | 3  | 2                           | NP | 2   | NP | 2              | NP             | 2                         | 3              | 1                            | 2  | NP  | NP | 1   | NP | 1 <sup>d</sup> | NP | 1   | NP |
| H-5                          | 2    | NP | 2                           | NP | 2   | NP | 2              | NP             | 2                         | NP             | 1                            | NP | NP  | NP | 1   | NP | 1              | NP | N   | NP |

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

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

N = No separation requirement.

NP = Not Permitted.

a. See Section 420.

b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but not to less than 1 hour.

c. See Sections 406.3.2 and 406.6.4.

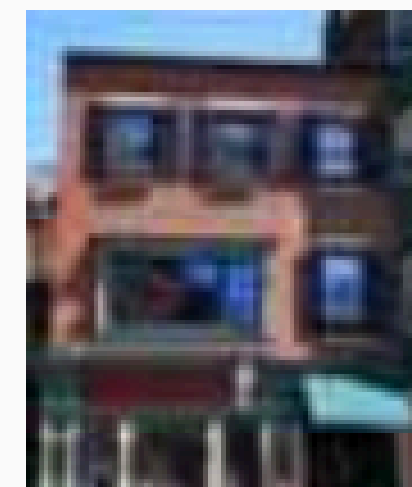
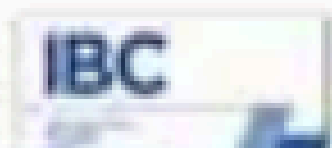
d. Separation is not required between occupancies of the same classification.

e. See Section 422.2 for *ambulatory care facilities*.

f. Occupancy separations that serve to define fire area limits established in Chapter 9 for requiring fire protection systems shall also comply with Section 707.3.10 and Table 707.3.10 in accordance with Section 901.7.

# 508.5 Live/Work Units

- Live/work provisions formerly in Section 419 have been moved to Section 508 regulating mixed-occupancy conditions.
- No change in any technical requirements, including allowance for a single Group R-2 classification (which is only reason to apply the provisions).
- Live/work use continues to not create a mixed occupancy condition.
  - Provision should be considered as an exception to the mixed occupancy concept.



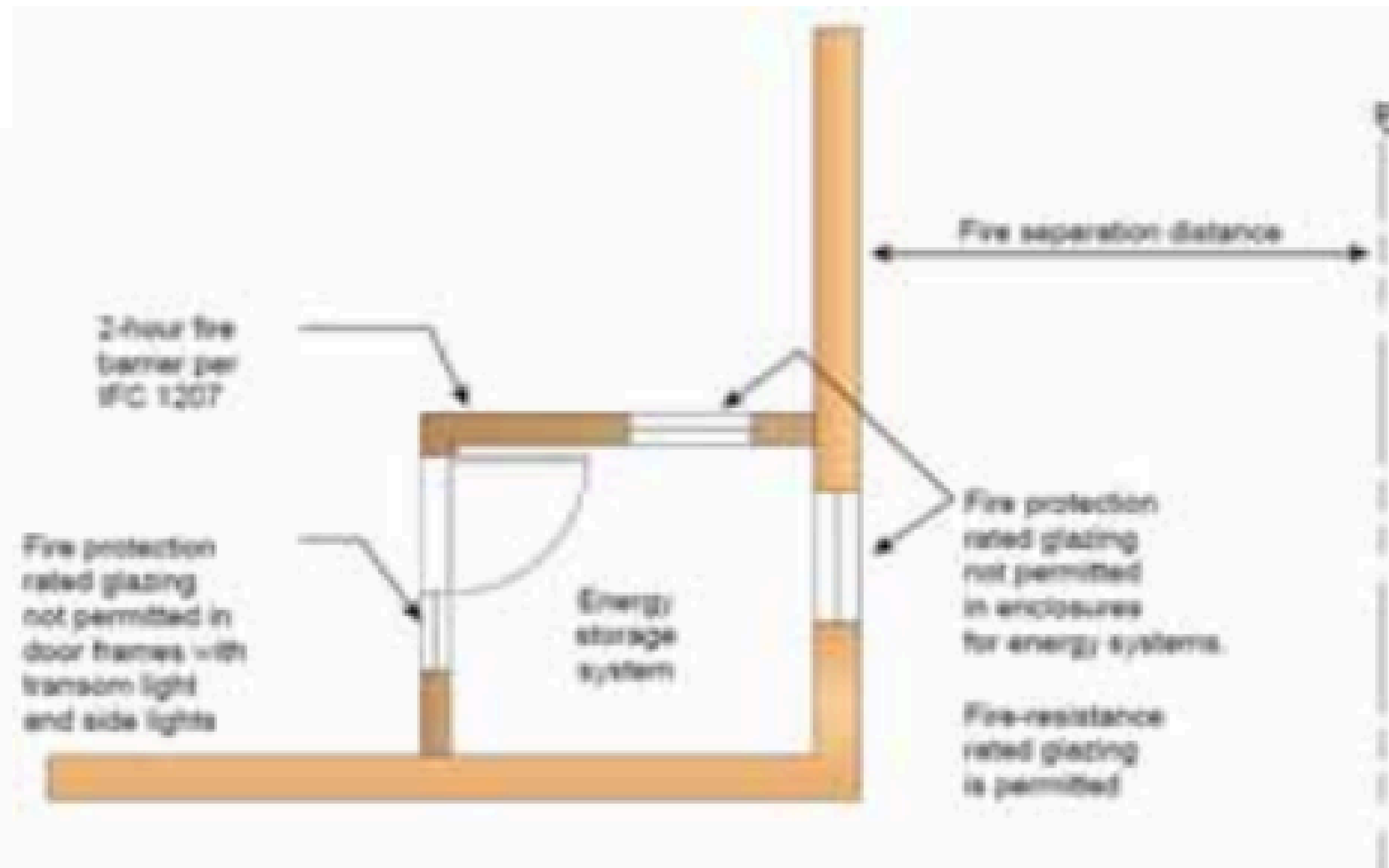
# 707.4, 716 Separation of Energy Storage Systems

- Where fire barriers enclose energy storage systems, fire-protection-rated glazing not permitted in:
  - Fire door frames with transom lights and sidelights, and
  - Fire window assemblies.
- Where glazing is provided, it must be fire-resistance-rated.
- Helps address concern of thermal runaway through resistance to heat flow through the glazing.



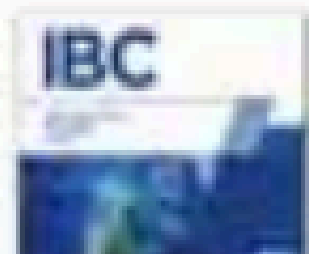
# 707.4, 716 Separation of Energy Storage Systems

- Enclosure requirements established in Table 1207.1 of the IFC, with a minimum required separation of 2-hour fire barriers.



# 806.9 Combustible Lockers as Interior Finish

- Combustible lockers now regulated for interior finish.
- Lockers to comply with Section 803 (Wall and Ceiling Finishes), except:
  - Where constructed entirely of wood and noncombustible materials, lockers are permitted wherever a Class C classification is acceptable.
- Consistent with IFC requirement for this type of “furnishing.”



## 903.2.4, 903.2.7, 903.2.9 Upholstered Furniture and Mattresses

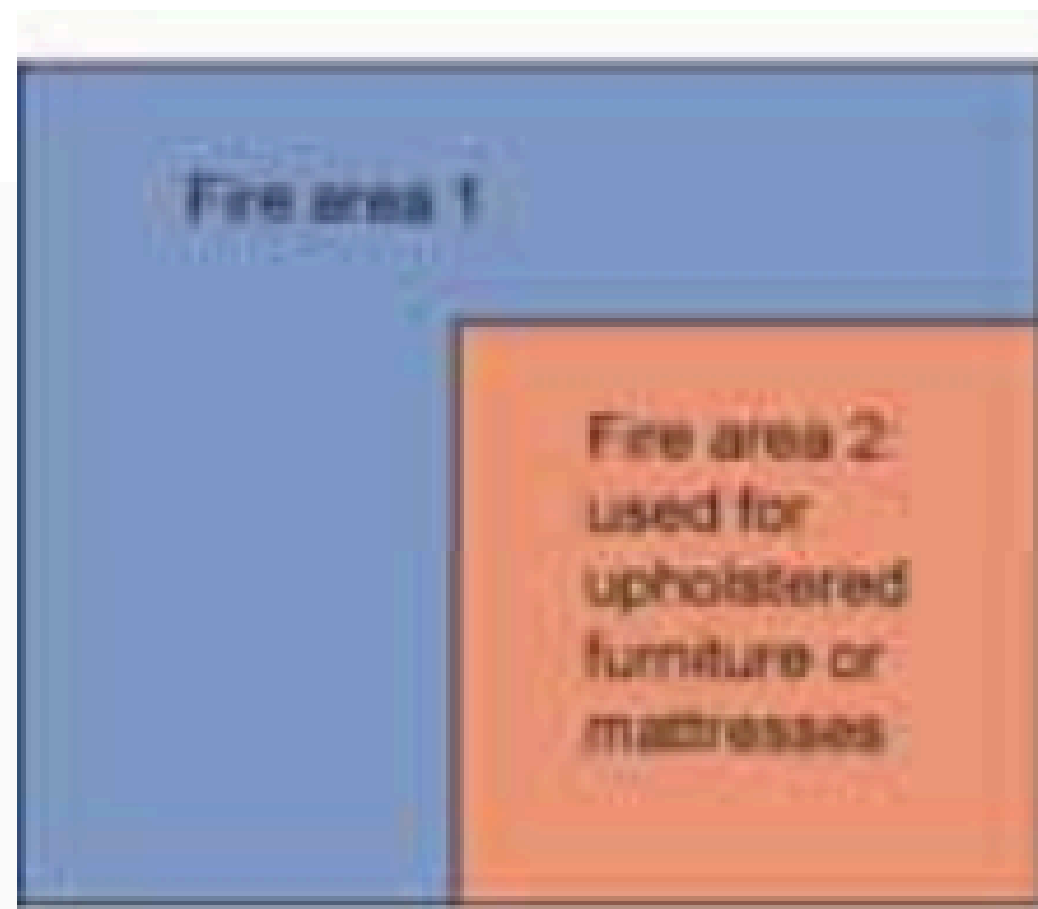
- Sprinkler scoping criteria for Groups F-1, M and S-1 where upholstered furniture or mattresses are manufactured, sold or stored have been revised.
  - Group F-1: Area threshold (2,500 sf) now based on size of fire area where upholstered furniture or mattresses are manufactured
  - Groups M: Area threshold (5,000 sf) now based on size of floor area within fire area used for display and sales of upholstered furniture or mattresses
  - Group S-1: Area threshold (2,500 sf) now based on size of floor area within fire area used for storage of upholstered furniture or mattresses





# 903.2.4, 903.2.7, 903.2.9 Upholstered Furniture and Mattresses

- In addition, where floor area threshold exceeded, sprinkler need only be provided in fire area and not throughout building.



Separation per  
Table 707.3.10

Sprinkler system required  
throughout fire area, if:

- F-1: > 2,500 sq. ft. **fire area** for manufacture
- M: > 5,000 sq. ft. **floor area** within fire area for display and sale
- S-1: > 2,500 sq. ft **floor area** within fire area for storage

# 903.2.4, 903.2.7, 903.2.9 Upholstered Furniture and Mattresses

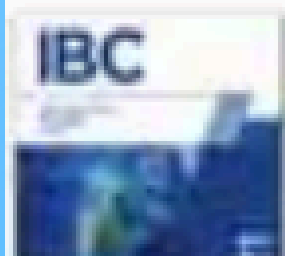
- In addition, new exception indicates that one-story Group S-1 self-storage facilities are exempt from 2,500 square foot sprinkler threshold where all storage spaces can be accessed directly from exterior.
  - General Group S-1 sprinkler threshold of 12,000 square feet continues to be applicable.
- Based on assumption that such facilities contain significant amount of upholstered furniture and/or mattresses.



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## 903.2.4.2, 903.2.9.3 Distilled Spirits

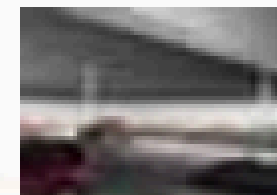
- Automatic sprinkler protection now required in all:
  - Group F-1 fire areas used for the manufacture of distilled spirits
  - Group S-1 fire areas used for the bulk storage of distilled spirits or wine.
- Part of a series of changes in IBC and IFC to eliminate confusion in regulation of such buildings.
  - Includes allowance that Group H classification not warranted regardless of quantities of hazardous materials.





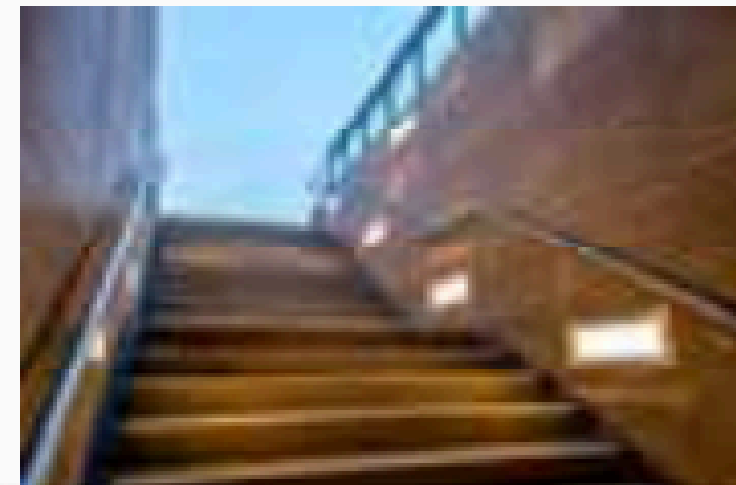
## 903.2.10 Sprinklers in Open Parking Garages

- Sprinklers now required in Group S-2 open parking garages where:
  - Any fire area exceeds 48,000 square feet, or
  - In a building having one or more stories with an occupant load  $\geq 30$  located  $\geq 55$  feet above lowest level of fire department vehicle access
- Sprinkler protection to extend throughout entire garage
- Concern based on:
  - Increased fuel load due to expanded use of plastics and lightweight materials in vehicles, as well as types of fuels being utilized
  - Recognition of a fire that occurred in a parking garage in Liverpool, England in late 2017



## 1008.2.1 Stairway Illumination

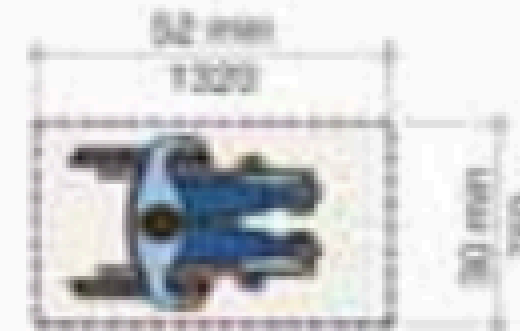
- Exit stairways, exit access stairways and their associated landings must now have an illumination level under normal power of at least 10 footcandles.
  - Measured at the walking surface
  - Not applicable to stairs in exit discharge
  - Required only when stairway is in use, allowing for occupant-sensor or daylight-responsive controls
  - Exceptions for auditoriums, theaters and similar assembly occupancies still applicable
- Considered as an easily accomplished means for improving stairway safety.



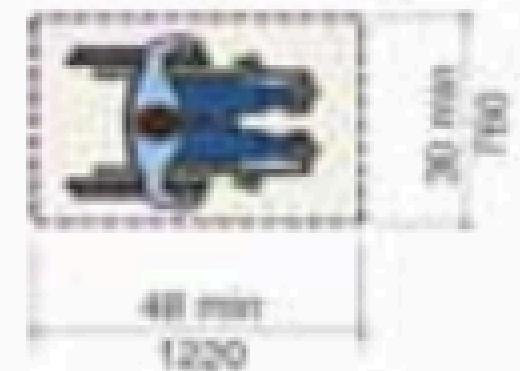
# 1009.6.3, 3008.6.4 Area of Refuge Floor Space

- Minimum required length of the clear floor space for a wheelchair has been increased to 52 inches to coordinate with 2017 edition of ICC A117.1 standard.
- Applicable to:
  - Areas of refuge (Section 1009.6.3)
  - Occupant evacuation elevator lobby (3008.6.4)
- Allows for increased accommodation for users of manual chairs, powered chairs and scooters.

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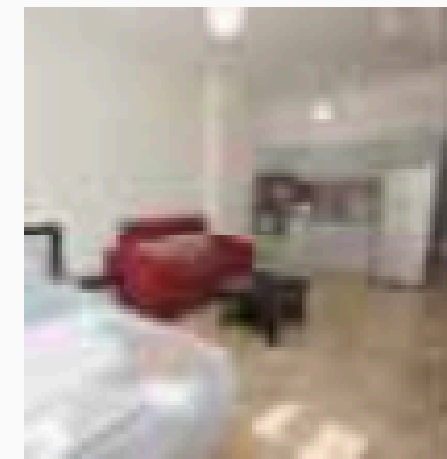
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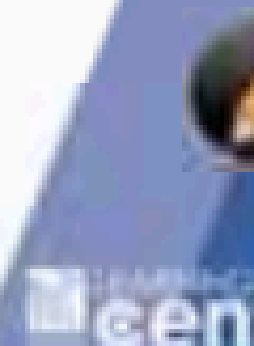
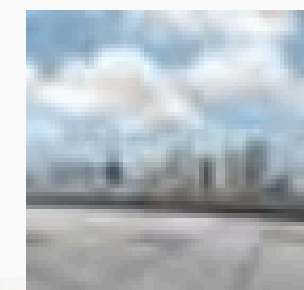
# 1208.4 Efficiency Dwelling Units

- A definition for an efficiency dwelling unit has been added.
  - **DWELLING UNIT, EFFICIENCY.** A dwelling unit where all permanent provisions for living, sleeping eating and cooking are contained in a single room.
- The minimum required floor area of an efficiency dwelling unit has been reduced from 220 to 190 square feet.
  - Based on minimum required room sizes of 120 square feet plus 70 square feet
- In addition, mandate of providing additional 100 square feet of floor area for each occupant in excess of two has been deleted.



## 1503.3 Parapet Walls

- Parapet walls now require moisture resistance in a manner similar to the remainder of the building.
- Specific modifications include:
  - Parapet coping and covering materials are no longer required to be noncombustible.
  - Top surface of the parapet wall to provide positive drainage.
- Where parapet wall is required by Section 705.11, it must be coped or covered with materials that are both weatherproof and maintain the required fire-resistance.
- Where Section 705.11 does not require a parapet wall, it only needs to be coped with weatherproof materials.





# 1705.13.7 Special Inspection of Steel Storage Racks

- Steel storage rack special inspection duties have been clarified with the addition of specific special inspection tasks.
- Requirement continues to be applicable only to racks that are at least 8 feet in height and assigned to SDC D, E or F.

**TABLE 1705.13.7  
REQUIRED INSPECTIONS OF STORAGE RACK SYSTEMS**

| TYPE                                                                                                                                          | CONTINUOUS<br>INSPECTION | PERIODIC<br>INSPECTION | REFERENCED<br>STANDARD       | IBC<br>REFERENCE |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|------------------------------|------------------|
| 1. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents. | —                        | X                      | —                            | —                |
| 2. Fabricated storage rack elements.                                                                                                          | —                        | X                      | —                            | Section 1704.2.5 |
| 3. Storage rack anchorage installation.                                                                                                       | —                        | X                      | ANSI/MH16.1<br>Section 7.3.2 | —                |
| 4. Completed storage rack system, to indicate compliance with the approved construction documents.                                            | —                        | X                      | —                            | —                |



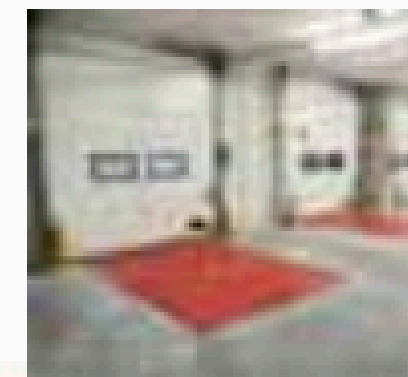
# 1705.18 Firestop Inspection in Group R

- In Group R fire areas with an occupant load > 250, special inspection is now required for the installation of:
  - Firestops
  - Fire-resistant joint systems
  - Perimeter fire containment systems
- Provides greater assurance that such fire protective features are properly installed where large residential occupant loads are anticipated.



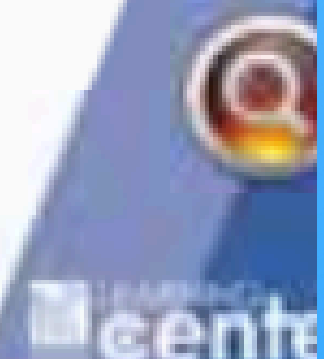
# 1709.5 Window and Door Assemblies

- Testing standards and analysis procedures are clarified for door and window assemblies, including garage doors.
- Garage doors now required to have a permanent label indicating:
  - Manufacturer
  - Model/serial number
  - Performance characteristics, including design wind pressure rating
- Provisions applicable regardless of whether building is in a hurricane-prone region.
- Provides for additional information regarding building's resilience.



# 3103.1 Special Event Structures

- Special event structures are now regulated as one of the types of temporary structures addressed in Section 3103.
- Such structures, defined in the 2018 IFC, are now similarly defined in the IBC.
  - **SPECIAL EVENT STRUCTURE.** Any ground-supported structure, platform, stage, stage scaffolding or rigging, canopy, tower or similar structure supporting entertainment-related equipment or signage.



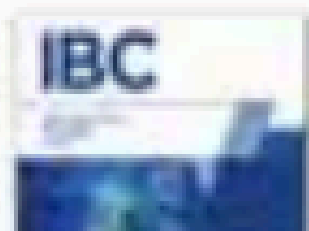


# 3103.1 Special Event Structures

- In addition to significant IFC requirements, key criteria for all temporary structures are established in IBC, including:
  - Code conformance for structural strength, fire safety, means of egress, accessibility, light, ventilation, sanitation
  - Permits
  - Construction documents
  - Location on lot
  - Means of egress

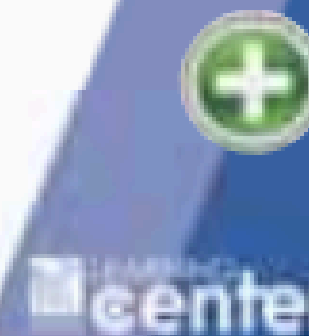
# 3115 Intermodal Shipping Containers

- Use of intermodal shipping containers as buildings and structures now addressed in code.
  - **INTERMODAL SHIPPING CONTAINERS.** A six-sided steel unit originally constructed as a general cargo container used for the transport of goods and materials.
- Previously, approval based on Section 104.11 addressing alternate methods and materials.
  - ICC G5-2019 *Guideline for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components*
  - Evaluation Reports



# 3115 Intermodal Shipping Containers

- New requirements designed to provide a consist set of code provisions that cover minimum safety requirements without duplicating existing code provisions.
- Mandates verification of a container's construction, condition and structural integrity to assist structural engineer in the evaluation for building construction.
- Provides for specific pointers to IBC provisions addressing protection against decay and termites, under-floor ventilation, roof assemblies and joints/voids.
- Introduces structural provisions unique to such containers.





# 3115 Intermodal Shipping Containers

- Provisions intended to supplement existing applicable IBC requirements, as well as :
  - Inspection by approved agency
  - Verification of data plate
  - Method of structural design (detailed design procedure or simplified method for single-units)
- Three ISO reference standards relevant to construction of intermodal shipping containers have been added to Chapter 35.
- New provisions intended to eliminate need for patchwork of potentially conflicting or duplicative requirements.



**Google form link for amendments to the codes**