2024 IBC Transition from the 2018 IBC

Based on the 2024 *International Building Code*

1

INSTRUCTOR

John M. Gibson, Jr., MCP, CBO, CPCA, CFM (Fire)

- **John M Gibson, Jr,** MCP, CBO, CPCA, CFM (Fire)
- **Manager, Technical Training**
- International Code Council
- P.O. Box 106
- Woodsboro, MD 21798
- jogibson@iccsafe.org
- 888-422-7233x7523

Building Professional Careers

2

GOAL & OBJECTIVES

Objectives

1) Identify the differences between 2024 IBC and the 2018 edition.
2) Determine if the change is an addition, deletion, modification or clarification.
3) Identify changes in format and technical requirements.
4) Explain the intent and application of the changes.

3

COURSE OUTLINE

- Administration and Definitions, Chapters 1 and 2
- Building Planning, Chapters 3 through 6
- Fire Protection, Chapters 7 through 9
- Means of Egress, Chapter 10
- Accessibility, Chapter 11
- Building Envelope, Structural Systems, and Construction Materials, Chapters 12 through 26
- Building Services, Special Devices, and Special Conditions, Chapters 27 through 34
- Appendices

4

Letter Designations in Front of Section Numbers

- In each code development cycle, proposed changes to the code are considered at the Code Development Hearings.
- Proposed changes to a code section that has a number beginning with a letter in brackets are considered by a different code development committee.
  - **[A]** Administrative
  - **[E]** Energy
  - **[EB]** Existing Building
  - **[F]** Fire
  - **[FG]** Fuel Gas
  - **[M]** Mechanical
  - **[P]** Plumbing

5

5

Format Changes to the 2024 I-Codes

6

6

Part 1

Administration

- Chapter 1 Scope and Administration
- Chapter 2 Definitions

7

7

104 Building Official Duties and Powers

- Provisions of Section 104 have been reformatted for consistency with other I-Codes
- In addition, approach for reviewing for code compliance significantly updated to reflect current manner that alternate materials, methods and designs are evaluated
- Four methods identified for determination of compliance:
  - Listed compliance
  - Technical assistance
  - Alternate materials, design and methods
  - Modifications

24

8

8

104 Building Official Duties and Powers

- For listed compliance, listing to be based on specified standard.
  - Where listing standard is not specified, listing to be based on an approved listing criteria.
- Technical assistance to be used to determine compliance where required by building official, with technical opinion and report prepared by a qualified individual, laboratory or organization.
- Performance-based alternatives acceptable when complying with *ICC Performance Code*.
  - Not applicable to alternative structural materials or alternative structural designs.

9 24

9

105.2 Fences Not Exempt from Permit

- Fences up to 7 feet in height no longer exempt from permit requirements where utilized as a swimming pool barrier.
- Recognizes life safety protection provided by minimum fence height, limitation on size of any openings, lack of climbability, and controlled gate access.
- Permit requirement provides mechanism for ensuring fence and its installation go through the plan review and inspection process.

10 24

10

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 712.1.9 permitting two-story opening conditions without regulation as an atrium.

11 21

11

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.

12 21

12

202 Definition of High-Rise Building

- Special provisions, found primarily in Section 403, mandated for buildings defined as "high-rise"
- Historically, such buildings are those with occupied floor more than 75 feet above the lowest level of fire department vehicle access
- "High-rise" designation now also applies where occupiable roof located above the 75-foot point
- Applicable concerns include:
  - Presence of occupants
  - Combustible furnishings
  - Difficulty of performing ground-based operations

13 24

13

202 Definition of Limited Verbal or Physical Assistance

- Applicable to Group I-1 and R-4 occupancies, more clarity provided for determining if Condition 2 designation is appropriate for group homes, assisted living facilities and other custodial care uses
- Category includes persons who may not independently recognize, respond or evacuate without limited verbal or physical assistance during an emergency situation
- Limited verbal assistance includes prompting, giving and repeating instructions
- Limited physical assistance includes help with transfer to walking aids or mobility devices and assistance with egress

14 24

14

202 Definition of Mass Timber

- Mass timber considered as structural elements of Type IV construction primarily of solid, built-up, panelized or engineered wood products that meet minimum cross-section dimensions.
- Single term represents both:
  - Heavy-timber designated as Type IV-HT which includes various types of members where fire-resistance is based on minimum dimensions.
  - Mass timber used in new Types IV-A, IV-B and IV-C that must have a fire-resistance rating.

15 21

15

202 Definition of Mass Timber

- New definition of *noncombustible protection* addresses the passive fire protection required for mass timber.
- Depending on the building's type of construction, mass timber may have a fire-resistance rating obtained:
  - By its own fire-resistive rating, or
  - Through a combination of the inherent mass timber fire-resistance plus protection with noncombustible insulating materials, or
  - Entirely by the noncombustible protection
- Use of noncombustible protection recognizes its value in delaying the combustion of mass timber members.

16 21

16

202 Definition of Occupiable Roof

- New definition of *occupiable roof* recognizes exterior space on a roof that is designed for human occupancy, other than maintenance or repair
- Revisions throughout code from "occupied roof," which was previously undefined, to "occupiable roof" will provide better consistency when applying provisions
- Egress is required from occupiable roof whether it is occupied or not

17 24

17

202 Definition of Puzzle Room

- Puzzle room is a new defined term that is mostly 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 particularly 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.

18 21

18

Part 2

Building Planning

- Chapter 3 Occupancy Classification and Use
- Chapter 4 Special Detailed Requirements Based on Occupancy and Use
- Chapter 5 General Building Heights and Areas
- Chapter 6 Types of Construction

19

19

304.1 Group B Occupancy Classification

- Electronic data processing has been modified to electronic data entry
  - Data entry considered an activity performed in an office environment
  - Data processing essentially automated work occurring in facilities typically accessed solely by maintenance personnel
    - More appropriately classified as Group F
- Lithium-ion and lithium metal battery testing, research and development activities now specifically addressed and identified as Group B occupancy
  - Moderate-hazard classification is appropriate due to extensive protection features as established in IFC 1207, including:
    - Detection
    - Suppression
    - Explosion control

20 24

20

306.2 Group F-1 Occupancy Classification

- Two new items added to listing of Group F-1 occupancies.
- Energy storage systems (ESS) in dedicated-use buildings.
  - Administrative/support areas without ESS permitted where ≤ 10% of floor area of the story where located
  - In mixed-occupancy buildings, ESS to be classified the same as major occupancy
  - Previously would often be classified as Group H-2, however new IFC provisions address potential hazards to allow for a reduction in occupancy classification.
- Water/sewer treatment plants
  - Typically contain materials in use that would warrant a Group H classification should MAQs be exceeded.

21 21

21

306.2 Group F-1 Occupancy Classification

- Group F-1 occupancy classification also now includes:
  - Energy storage systems (ESS) and equipment containing lithium-ion or lithium metal batteries
  - Manufacture of lithium-ion batteries
  - Manufacture and assembly of vehicles powered by lithium-ion or lithium metal batteries
- Recognition as Group F-1 based on moderate degree of hazard due to large part to safeguards mandated in IFC.

22 24

22

306.2, 306.3 Group F Occupancy Classification

- Distilleries and similar alcohol beverage alcoholic beverage manufacturing facilities now considered as Group F-1. occupancies where alcohol content exceeds 20 percent.
  - Previous threshold for Group F-1 classification was 16 percent.
  - Group F-2 classification now applicable where alcohol content is 20 percent or less.
- Provides consistency with recognition that:
  - Beverages with alcohol content greater than 20 percent is considered an ignitable liquid requiring further regulation.
  - Where alcohol content does not exceed 20 percent, beverages in glass or ceramic containers considered as Class I commodities.

23 24

23

307.1.1 Group H Occupancy Exemptions

- 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.

24 21

24

307.1.1, 414.1 Group H Occupancy Exemptions

- Reformatting of Section 307.1.1 provides for a more organized and comprehensive presentation of those conditions and materials that are exempt from:
  - Classification as a Group H occupancy, and
  - Needing to comply with any of general hazardous material regulations of Section 414 (Section 414.1)
- Replaces previous listing of exceptions in Section 307.1.1 and applicable notes to Tables 307.1(1) and 307.1(2)

25 24

25

307.1.1, 414.1 Group H Occupancy Exemptions

TABLE 307.1.1 HAZARDOUS MATERIAL EXEMPTIONS[a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging.
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.

(continued)

26 24

26

307.1.1, 414.1 Group H Occupancy Exemptions

2018 to 2024 IBC Format Changes for Group H Occupancy Exemptions

Material Classification	Occupancy or Classification	2021 Source
Combustible fiber	Baled cotton	Table 307.1(1), note a
Corrosive	Building materials	Section 307.1.1, Item 11
	Personal and household products	Section 307.1.1, Item 10
	Retail and wholesale sales occupancies	Table 307.1(2), note c
Explosives	Groups H, F, M and S	Section 307.1.1, Item 14
	Groups M and H-3	Section 307.1.1, Item 14
Flammable and combustible liquids and gases	Aerosols	Section 307.1.1, Item 12
	Alcoholic beverages	Sections 307.1.1, Items 6, 18 and 19; Table 307.1(1), note c
	Cleaning establishments with combustible liquid solvents	Section 307.1.1, Items 4 and 5
	Closed piping systems	Section 307.1.1, Item 3
	Fuel	Table 307.1(1), notes g #1 - #4
	Fuel oil	Table 307.1(1), note i

(continued)

27 24

27

310.4 Group R Occupancy Classification

- In addition to several clarifications of various residential uses, the lodging house provisions have been revised
  - Emergency services living quarters introduced as congregate living facilities
- Scoping provisions for bed and breakfast establishments and similar lodging houses classified as a Group R-3 occupancy no longer mandate a maximum of 10 occupants
- In addition, no longer an occupant load limit required for construction of an owner-occupied lodging house under the *International Residential Code*
- Threshold of five guest rooms remains as sole factor for lodging house classification

28 24

28

311.2, 311.3 Group S Occupancy Classification

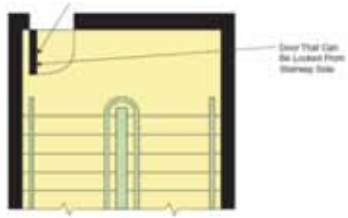
- Group S-1 classification for storage of lithium-ion and lithium metal batteries, as well as repair garages for vehicles powered by lithium-ion or lithium metal batteries consistent with Group F-1 manufacturing classification for similar materials and activities.
- In addition, storage of aerosol cooking spray and plastic aerosol 3 products to be considered Group S-1 occupancies.
- Classification as Group S-1 and S-2 facilities where alcohol beverages are stored consistent with Group F-1 and F-2 manufacturing designations based on threshold of 20 percent alcohol content.

29 24

29

403.5.3 High-Rise Building Stairway Door Operations

- Stairway doors locked from stairway side to be capable of being unlocked without unlatching where any of following conditions occur:
  - Individually or simultaneously upon signal from fire command center, or
  - Simultaneously upon activation of fire alarm signal in area served by stairway, or
  - Upon failure of power supply to lock or locking system.

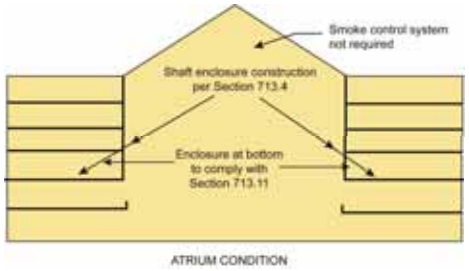


30 24

30

404.5 Smoke Control in Atriums

- Recognizes that the combination of shaft enclosure and atrium condition provides the necessary degree of separation expected between multiple stories.



31 21

31

404.6, #5 Enclosure of Atriums

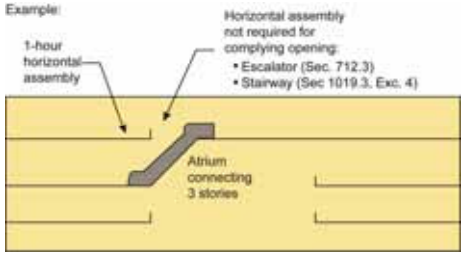
- Fire barrier no longer required between atrium and adjoining spaces in Group I-2 and I-1, Condition 2 occupancies provided:
  - Adjoining spaces do not include or provide access to care recipient sleeping and treatment rooms, and
  - Applicable to no more than three stories, and
  - Adjoining spaces included in design of smoke control system
- New allowance provides equivalency with federal guidelines for certification of health care facilities.

32 24

32

404.6, #6&7 Horizontal Assemblies in Atriums

- New allowance recognizes that complying floor openings for escalators (Section 712.3 and exit access stairways (Section 1019.3, Exception 4) are permitted in a horizontal assembly that isolates atrium from other stories in the building.



33 21

33

407.4.4.4 Circulation Paths Within a Care Suite

- Circulation paths within a care suite that lead to required egress doors to be a minimum of 36 inches in width.
- Such paths are not to be regulated as aisles or corridors.
- New provisions clarify intent of care suite provisions recognizing increased supervision of patients is required.

34 24

34

407.6.1 Automatic-Closing Doors in Group I-2

- In Group I-2, the closing of any automatic-closing doors on hold-open devices must now also occur upon activation of fire alarm system, sprinkler system or both.
  - Activation continues to also occur upon actuation of smoke detectors or loss of power to the hold-open device or smoke detector.
- In addition, all automatic-closing doors with hold-open devices that are located in the same smoke compartment to release upon the automatic release of the hold-open device on any one of such doors.
- New provisions also provide consistency with CMS federal standard.

35 21

35

411.1, Exception 2 Puzzle Rooms

- As defined in Section 202, puzzle rooms now regulated as special amusement areas.
- Puzzle rooms not required to comply with multiple fire- and life-safety requirements of Section 411 where means of egress meets the fundamental requirements of Chapter 10:
  - Unlocked
  - Readily available
  - Always available

36 21,24

36

414.2.3 Fire Wall Use for Control Areas

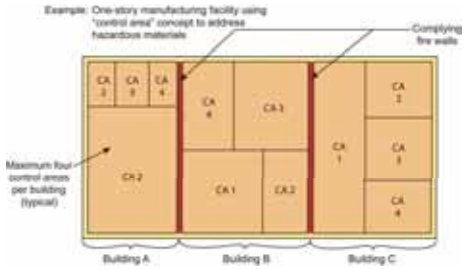
- For purposes of determining the number of control areas in a building, each portion separated by one or more fire walls shall be considered a separate building.
  - Previously, the "separate building" allowance has been limited to allowable area, allowable height and type of construction

37 21

37

414.2.3 Fire Wall Use for Control Areas

- New allowance permits additional quantities of hazardous materials without classification as a Group H occupancy by increasing the number of control areas permitted in the structure.



38 21

38

423.4.1, 423.5.1 Storm Shelter Design Occupant Capacity

- Required design occupant capacity of storm shelters has been newly established for critical emergency operations facilities and modified for Group E occupancies.
- Applicable to both types of facilities, a new exception allows for a reduction in occupant capacity below that calculated is permitted where approved by building official.
  - Similar to allowance in Section 1004.1.2 for means of egress.
- Both emergency operations and educational facilities now provided with same:
  - Three exceptions to base requirement, and
  - Limitations on distance of travel to door of the shelter.

39 24

39

423.4.1, 423.5.1 Storm Shelter Design Occupant Capacity

- Required design capacity of storm shelters:
  - For critical operation facilities, total occupant load of offices plus number of beds.

  - For Group E occupancies, total occupant load of classrooms, vocational rooms and offices (largest assembly space criteria no longer applicable)

40 24

40

424 Play Structures

- No longer limited to structures used solely by children, such as climbing walls.
- Additional requirements now applicable 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.

41 21

41

503.1.4.1 Occupiable Roof Enclosures

- Where high-rise building includes an occupiable roof, barriers and similar structures may now exceed 48 inches in height without classification of roof as an additional story.
- Includes variety of elements, including parapets, guards and bulkheads that would not necessarily be addressed under the allowances for penthouses and other rooftop structures.

42 24

42

Table 504.3 Allowable Height in Feet

- Limits to building height (in feet) have been developed for Types IV-A, IV-B and IV-C construction
- Sprinklered and nonsprinklered options
- Establishment of allowable height started with setting IV-B allowances equivalent to Type IB.
- No unlimited heights for Type IV-A, but typically an increase of 1.5 over Type IV-B.
- Type IV-C generally equivalent to IV-HT limits.
- No additional heights over that permitted for Type IV-HT are permitted for nonsprinklered buildings.

43 21

43

Table 504.3 Allowable Height in Feet

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

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION											
		TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	270	180	85	85	70	60
H-1, H-2, H-3, H-5	NS[b,c]	UL	160	65	55	65	55	120	90	65	65	50	40
	S												
H-4	NS[b,c]	UL	160	65	55	65	55	95	85	65	65	50	40
	S	UL	180	85	75	85	75	140	100	85	85	70	60
I-1 Condition 1, I-3	NS[b,c]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
I-1 Condition 2, I-2	NS[b,c,i]	UL	160	65	55	65	55	95	85	65	65	50	40
	S	UL	180	85									
I-4	NS[b,c]	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
R[e]	NS[b]	UL	160	65	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	270	180	85	85	70	60

No changes to footnotes.

44 21

44

Table 504.4 Allowable Height in Stories

- Limits to number of stories above grade plane have been established for Types IV-A, IV-B and IV-C construction.
- Rationale for story limits similar to that for height in feet.
- Where building is not sprinklered:
  - Limits on stories same as that allowed for Type IV-HT.
- Consistent with allowable height in feet and allowable floor area, each occupancy reviewed individually to address specific hazards that would warrant a variance from the established process.

45 21

45

Table 504.4 Allowable Height in Stories

- Story limits have also been modified for specific Group S-1 and S-2 occupancies.
- Height limits for Group S-1 occupancies in fully-sprinklered buildings of Type IIB and IIIB construction have been increased from three to four stories.
  - Restores story limits of 2006 IBC that were part of numerous reductions due to inconsistencies in original thresholds.
- Group S-2 story limitations for buildings of Type IV-HT construction have been increased by one story, to five stories in nonsprinklered buildings and six stories in sprinklered buildings.
  - Corrects two tabular errors that went undetected in transition from Table 503 in 2012 IBC to Table 504.4 in 2015 edition.

46 21

46

Table 504.4 Allowable Height in Stories

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

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION											
		TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	3	3	3	2	1
	S	UL	6	4	3	4	3	9	6	4	4	3	2
A-2	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-3	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-4	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	1	1	1	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	12	6	4	6	4	18	12	9	6	4	3
S-1	NS	UL	11	4	2	3	2	4	4	4	4	3	1
	S	UL	12	5	3d	4	3d	10	7	5	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	4	4-1	4	2
	S	UL	12	6	4	5	4	12	8	5	5-1	5	3

47 21

47

Table 506.2 Allowable Building Area

- Limits to building floor areas have been developed for Types IV-A, IV-B and IV-C.
- No unlimited area permitted for any of Type IV classifications.
- Initially, allowable area factors for Type IV-HT construction were increased by following multipliers:
  - Type IV-C: x 1.25
  - Type IV-B: x 2.00
  - Type IV-A: x 3.00
- Factors then re-examined on a case-by-case basis regarding their relative hazard and occupancy classification.

48 21

48

Table 506.2 Allowable Building Area

- Allowable area factor also modified for Group I-3 occupancies in one-story buildings of Type IIA construction.
  - Limit of 45,000 square feet has been increased to 60,000 square feet for single-story fully-sprinklered buildings.
  - Corrects tabular error that went undetected in transition from Table 503 in 2012 IBC to Table 504.4 in 2015 edition.

49 21

49

Table 506.2 Allowable Building Area

ALLOWABLE AREA FACTOR (A_a = NS, S1, S13R, S13D OR SM, as applicable) IN SQUARE FEET[a,b]

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION											
		TYPE I		TYPE II		TYPE III		TYPE IV			TYPE V		
		A	B	A	B	A	B	A 3xHT	B 2xHT	C 1.25xHT	HT	A	B
I-1	NS[c]	UL	55,000	19,000	10,000	16,500	10,000	54,000	36,000	18,000	18,000	10,500	4,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	216,000	144,000	72,000	72,000	42,000	18,000
	SM	UL	165,000	57,000	30,000	49,500	30,000	162,000	108,000	54,000	54,000	31,500	13,500
I-2	NS[c]	UL	UL	15,000	11,000	12,000	NP	36,000	24,000	12,000	12,000	9,500	NP
	S1	UL	UL	60,000	44,000	48,000	NP	144,000	96,000	48,000	48,000	36,000	NP
	SM	UL	UL	45,000	33,000	36,000	NP	108,000	72,000	36,000	36,000	28,500	NP
I-3	NS[c]	UL	UL	15,000	10,000	10,500	7,500	36,000	24,000	12,000	12,000	7,500	5,000
	S1	UL	UL	60,000	40,000	42,000	30,000	144,000	96,000	48,000	48,000	30,000	20,000
	SM	UL	UL	45,000	30,000	31,500	22,500	108,000	72,000	36,000	36,000	22,500	15,000
I-4	NS[c]	UL	60,500	36,500	13,000	23,500	13,000	76,500	51,000	25,500	25,500	18,500	9,000
	S1	UL	121,000	106,000	52,000	94,000	52,000	306,000	204,000	102,000	102,000	74,000	36,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	229,500	153,000	76,500	76,500	55,500	27,000
M	NS	UL	UL	21,500	12,500	18,500	12,500	61,500	41,000	20,625	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	246,000	164,000	102,500	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	184,500	123,000	76,875	61,500	42,000	27,000

50 21

50

506.3.2 Allowable Area Frontage Increase

- Methodology for determining allowable area increase for open frontage has been simplified through use of a tabular format.
- Table 506.3.3 based on two criteria:
  - Smallest public way or open space that ≥ 20 feet, and
  - Percentage of building perimeter having ≥ 20 feet of public way and/or open space
- Allowance for weighting the open space area increase has been eliminated
  - Interpolation within Table 506.3.3 is permitted

51 21

51

506.3.2 Allowable Area Frontage Increase

- Resulting frontage increase intended to be consistent with increase determined by previous method
  - In some cases, greater frontage increases are provided as compared to past methodology
- Under certain circumstance, a greater frontage increase may be available to the designer if one or more open spaces not recognized when applying Table 506.3.3 or 506.3.3.1

TABLE 506.3.3 Frontage Increase Factor[a]

Percentage of Building Perimeter	Open Space			
	0 to less than 20 Feet	20 to less than 25 Feet	25 to less than 30 Feet	30 Feet or greater
0 to less than 25	0	0	0	0
25 to less than 50	0	0.17	0.21	0.25
50 to less than 75	0	0.33	0.42	0.50
75 to 100	0	0.50	0.63	0.75

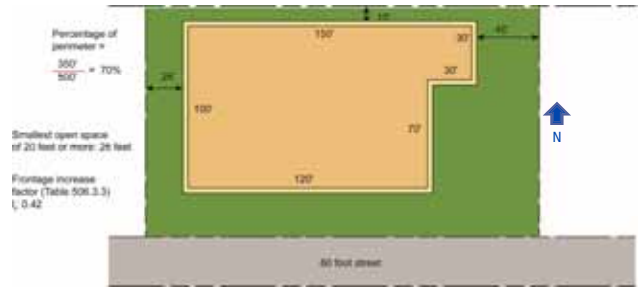
a. Interpolation is permitted.

52 21

52

506.3.2 Allowable Area Frontage Increase

- EXAMPLE:



Note: If west open space is ignored, I_f would be 0.50 based on 50% of perimeter open with smallest open space of ≥ 30 feet

53 21

53

Table 509.1 Incidental Uses

- Sprinkler protection is now mandated in the following incidental use areas in ambulatory care facilities:
  - Storage rooms greater than 50 square feet
  - Waste and linen collection rooms with an aggregate volume of 8.67 cubic feet or greater
- Such rooms now require both the previously mandated 1-hour fire barrier/horizontal assembly separations as well as the new mandate for sprinkler protection
- Additional changes include lowering the following thresholds for inclusion as an incidental use for consistency with CMD federal standard:
  - Waste/linen collection rooms: Reduction from ≥ 10 cf to ≥ 8.67 cf
  - Storage rooms: Reduction from < 100 sf to < 50 sf

54 24

54

Table 509.1 Incidental Uses

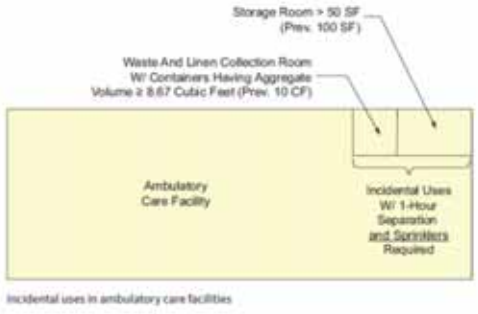
TABLE 509.1 INCIDENTAL USES

In Group I-2, laundry rooms over 100 square feet	1 hour and provide automatic sprinkler system
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour and provide automatic sprinkler system
In Group I-2, physical plant maintenance shops	1 hour and provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of ~~10~~ 8.67 cubic feet or greater	1 hour and provide automatic sprinkler system
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than ~~100~~ 50 square feet	1 hour and provide automatic sprinkler system
Electrical installations and transformers	See Sections 110.26 through 110.34 and Sections 450.8 through 450.48 of NFPA 70 for protection and separation requirements.

55 24

55

Table 509.1 Incidental Uses



Incidental uses in ambulatory care facilities

56 24

56

510.2, #4 Stairway Construction in Podium Buildings

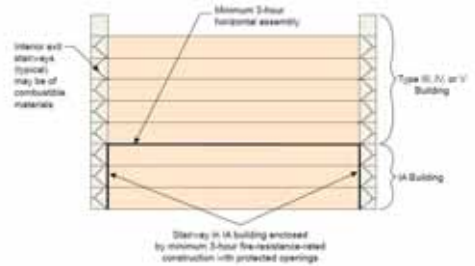
- Stairway construction in Type IA (lower) portion of podium buildings now permitted to be of combustible materials where two conditions exist:
  - Upper building is of Type III, IV or V construction, and
  - Stairway in lower building enclosed by minimum 3-hour fire-resistance-rated construction (shaft enclosure) with protected openings.
- Addresses confusion on how to address stairway construction that connects combustible and noncombustible portions of a podium building.
  - Section 1011.7 indicates stairways to be built of materials permitted based on building's type of construction.

57 21

57

510.2, #4 Stairway Construction in Podium Buildings

- Stairway is conceptually located totally within upper Type III, IV or V building, thus allowing for combustible stairway construction.
  - Minimum 3-hour fire-resistance-rated separation fully separates "combustible" construction from "noncombustible" construction.



58 21

58

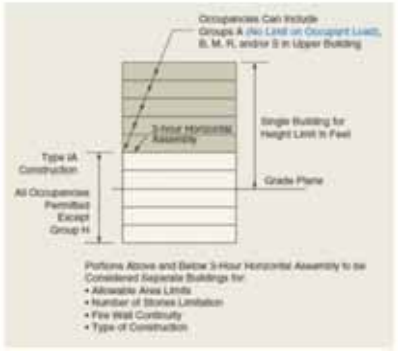
510.2, #1&5 Horizontal Building Separations

- Where the horizontal building separation allowance (podium buildings) of Section 510 is applied, the restriction on occupant loads for the upper building has been eliminated
- Previously, the only Group A occupancies permitted above the podium level were those with an occupant load of less than 300
- In addition, where vertical offsets occur in the horizontal separation required between the upper and lower buildings, the offsets shall be constructed as for fire barriers

59 24

59

510.2, #5 Horizontal Building Separations



60 24

60

Table 601 Type IV Fire-Resistance

- Table 601 identifying minimum fire-resistance rating for building elements based on type of construction has been expanded to include new Type IV-A, IV-B and IV-C buildings.
- General comparison with Type IA (IV-A) and Type IB (IV-B and IV-C).
- Also clarifies that heavy timber roof construction, including primary structural frame members, permitted in: Type IB, IIA, IIB, IIIA and VA buildings.
  - Allows for nonrated combustible roof construction
- In Type IV-HT construction, interior bearing walls supporting > 2 floors or > 1 floor and a roof to have minimum 1-hour fire-resistance rating

61 21

61

Table 601 Type IV Fire-Resistance

TABLE 601 Fire-Resistance Rating Requirements for Building Elements (Hours)

Building Element	Type I A	Type I B	Type II A	Type II B	Type III A	Type III B	Type IV A	Type IV B	Type IV C	Type IV HT	Type V A	Type V B
Primary structural frame[1]	3[a]	2[a,b]	1[b]	0	1[b]	0	3[c]	2[c]	2[c]	HT	1[b]	0
Bearing walls												
Exterior[a,f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[c]	2[c]	1	0	1	0	3	2	2	1/HTY	1	0
Nonbearing walls and partitions Exterior	See Table 602 705.5											
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	2	2	2	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 2021)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 2021)	1½[f]	1[b,f]	1[b]	0[f]	1[b,f]	0	1½	1	1	HT	1[b]	0

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

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

62 21

62

602.4 Mass Timber Type IV Buildings

- Type IV-A, IV-B and IV-C buildings may be constructed of mass timber and noncombustible materials.
- Required fire-resistance ratings may come from mass timber, noncombustible protection, or both.
  - Protective material to be applied directly to the timber members
  - Assigned time determined per Sections 703.2 and 722.7
- For Type IV-HT construction, minimum timber member dimensions of Section 2304.11 continue to be applicable.

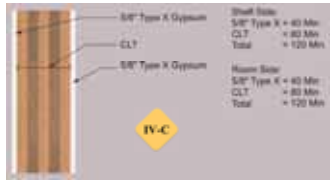
63 21

63

602.4 Mass Timber Type IV Buildings

- In buildings of Type IV-A, IV-B and IV-C construction with an occupied floor > 75 feet above lowest level of fire department vehicle access, mass timber interior exit stairways and elevator enclosures to be additionally protected where:
  - ≤ 12 stories or 180 feet: Interior faces of mass timber to be covered with noncombustible protection
  - > 12 stories or 180 feet: Only noncombustible materials

Up to 12 stories or 180 ft



64 21

64

602.4 Mass Timber Type IV Buildings

- Limited changes to existing heavy timber provisions now designated as Type IV-HT.
- Combustible concealed spaces permitted in all Type IV categories where in conformance with Sections 602.4.1 through 602.4.4.
- Publication *Mass Timber Buildings and the IBC* by ICC and AWC addresses Type IV construction in detail.

65 21

65

602.4.1- 602.4.3 Type IV-A, IV-B and IV-C Buildings

- Type IV-A construction mandates that faces of all timber members be protected with noncombustible materials.
  - Noncombustible wall and ceiling protection to contribute a time per Table 722.7.1(1), but not less than 80 minutes.
- Type IV-B construction mandates similar protection, but only required on an established percentage of members.
  - Some degree of exposed timber permitted
- Type IV-C construction permits all timber members to be unprotected.

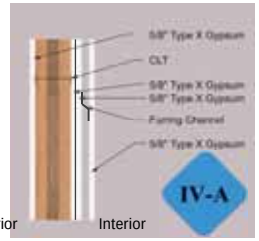
Type IV-A	Type IV-B	Type IV-C
100% Noncombustible (NC) **protection on all surfaces** of Mass Timber	100% NC protection on all surfaces of mass timber except for **limited exposed mass timber** elements	**100% exposed mass timber** except: shafts, concealed spaces, and outside of exterior walls

66 21

66

602.4.1 Type IV-A Buildings

- Type IV-A construction mandates:
  - Outside face of exterior walls of mass timber construction to have noncombustible protection with minimum assigned time of 40 minutes.
  - Interior faces of all mass timber elements, including inside faces of exterior mass timber walls and mass timber roofs, to have noncombustible protection with minimum assigned time of 80 minutes.
  - Floor assemblies to contain a noncombustible material at least 1 inch thick above mass timber with underside protected to same criteria as for other interior faces (80 minutes).



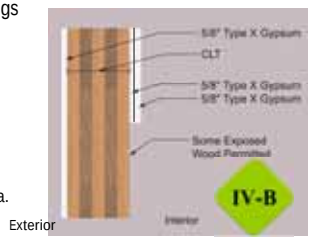
3-hr Exterior Bearing Wall

67 21

67

602.4.2 Type IV-B Buildings

- Type IV-B construction requires same degree of noncombustible protection as mandated for Type I-B buildings.
- Unprotected portions of mass timber ceilings and walls permitted in Type IV-B buildings where:
  - Limited to a wall area equal to 40% of the floor area in any dwelling unit or fire area, or
  - Limited to a ceiling area equal to 100% of the floor area in any dwelling unit or fire area, or
  - A combination of unprotected wall and ceiling areas determined by applying the unity formula.



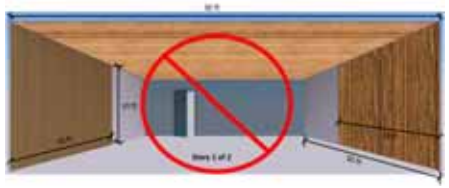
2-hr Exterior Bearing Wall

68 21,24

68

602.4.2 Exposed Mass Timber in Type IV-B Construction

- In addition, multiple-story floor areas are prohibited from being used to determine the allowable exposed mass timber in ceilings and walls in multi-story dwelling units and fire areas
  - Prohibition due to no testing of such conditions
- Each story to be evaluated on a story-by-story basis



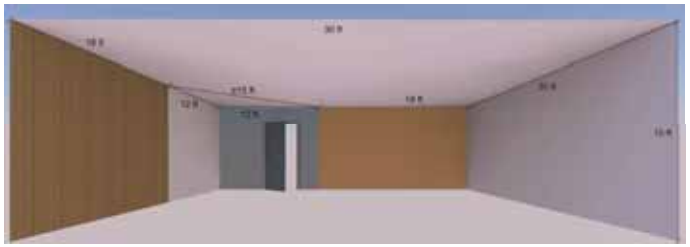
For example, it would not be appropriate to have 100% of the ceiling and 40% of the walls (based on floor area) exposed on one of the two stories.

69 24

69

602.4.2 Exposed Mass Timber in Type IV-B Construction

- In each dwelling unit or fire area, unprotected portions of mass timber walls to be ≥ 15 feet from other unprotected portions of other walls.

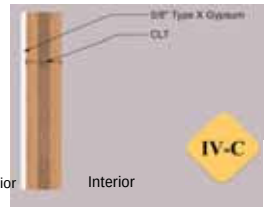


70 21,24

70

602.4.3 Type IV-C Buildings

- Type IV-C construction differs significantly from Types IV-A and IV-B as mass timber located on building's interior can be fully exposed, except for:
  - Concealed spaces
  - Shaft enclosures and interior exit stairways
- In addition, Type IV-C differs from Type IV-HT regarding fire-resistance-rated protection of building elements.
  - Minimum 2-hour rating required for bearing walls, floors and primary structural frame elements, however such rated elements need not be covered with noncombustible protection.



2-hr Exterior Bearing Wall

71 21

71

602.4.1- 602.4.3 Type IV-A, IV-B and IV-C Buildings

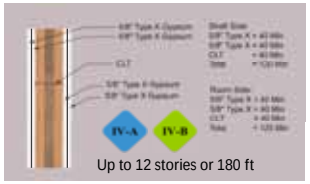
- Concealed spaces in Type IV-A, IV-B and IV-C buildings shall not contain combustibles other than electrical, mechanical, fire protection and plumbing materials and equipment permitted in plenums per IMC Section 602.
  - Combustible construction forming concealed spaces to be protected with noncombustible materials with minimum assigned time of:
    - 80 minutes in Types IV-A and IV-B
    - 40 minutes in Type IV-C

72 21

72

602.4.1- 602.4.3 Type IV-A, IV-B and IV-C Buildings

- In shaft construction, both shaft and room sides of mass timber elements to be protected with noncombustible materials with minimum assigned time of:
  - 80 minutes in Types IV-A and IV-B
  - 40 minutes in Type IV-C



73 21

73

602.4.4 Type IV-HT Buildings

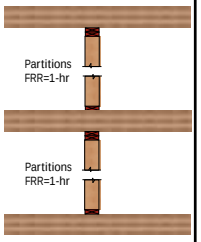
- Type IV-HT represents the traditional heavy timber construction type where fire-resistance relies almost solely on minimum cross-sectional dimensions.
- All fire-resistance based on dimensions of timber members, prescriptive rather than performance.
- Modifications made where FRT wood is used within exterior wall assemblies:
  - Minimum 6-inch thickness deleted
  - CLT minimum thickness (4") regulated rather than wall thickness (6")

74 21

74

602.4.4 Type IV-HT Buildings

- Concealed spaces now permitted provided no combustibles other than building elements and electrical, mechanical, fire protection and plumbing materials permitted in plenums per IMC Section 602, and protected by one of following:
  - Building is sprinklered throughout, including within concealed space, or
  - Concealed space is completely filled with noncombustible insulation, or
  - Surfaces within concealed space to be fully covered with minimum 5/8" Type X gypsum board
- Exception allows concealed spaces within interior walls and partitions having minimum 1-hour rating with no additional protection.



75 21

75

Part 3

Fire Protection

- Chapter 7 Fire and Smoke Protection Features
- Chapter 8 Interior Finishes
- Chapter 9 Fire Protection and Life Safety Systems

76

76

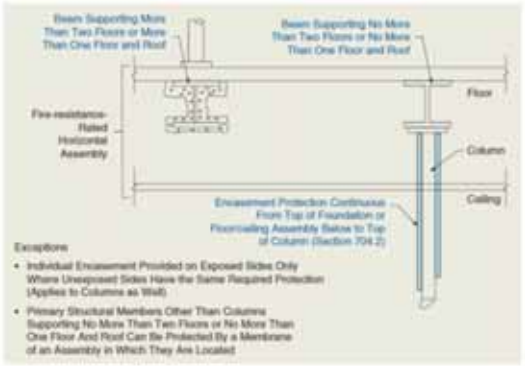
704.2, 704.3 Protection of Primary and Secondary Structural Members

- For clarity purposes, provisions addressing primary and secondary structural members have been reformatted in two sections.
- Section 704.2 now covers protection of primary structural frame members, including columns.
  - New exception recognizes that individual encasement is permitted on exposed sides of columns provided unexposed sides have same required protection.
- Section 704.3 now addresses secondary structural members.

77 24

77

704.2, 704.3 Protection of Primary and Secondary Structural Members



78 24

78

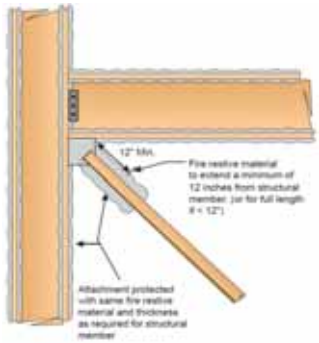
704.6.1 Secondary Attachments and Fireproofing

- Where primary and secondary structural steel members require fire protection, secondary steel attachments to have same protective material and thickness as required for primary member to address heat transfer.
- Protection to extend away from primary member:
  - At least 12 inches, or
  - Applied to entire length where attachment < 12 inches in length.
- Where attachment is hollow and ends are open, fire-resistive material and thickness to be applied to both the interior and exterior of the hollow steel attachment.

79 21

79

704.6.1 Secondary Attachments and Fireproofing

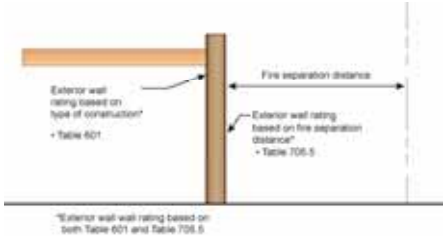


80 21

80

Table 705.5 Exterior Wall Ratings

- Previous Table 602 addressing "Fire-resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance" has been relocated.
- Relocation is deemed appropriate as Chapter 7 is the primary location for establishing exterior wall requirements related to fire-resistance.
- In addition, entries have been made for new construction types IV-A, IV-B and IV-C.



81 21

81

Table 705.5 Exterior Wall Ratings

TABLE 602 705.5 Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance[a,d,g]

Fire Separation Distance = X (feet)	Type Of Construction	Occupancy Group H[e]	Occupancy Group F-1, M, S-1[f]	Occupancy Group A, B, E, F-2, I, R[f], S-2, U[b,g]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA, IV-A Others	3 2	2 1	1 1
10 ≤ X < 30	IA, IB, IV-A, IV-B IB, VB Others	2 1 1	1 0 1	1[c] 0 1[c]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

82 21

82

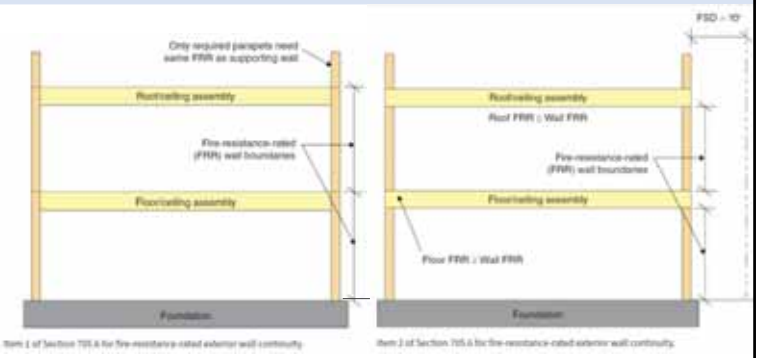
705.6 Exterior Wall Fire Rating Continuity

- The continuity requirements for the fire-resistance rating of exterior walls are now addressed for two conditions
- The required rating shall extend from the top of the foundation or floor/ceiling below to one of the following:
  - Underside of floor or roof sheathing , deck or slab above, or
  - Underside of floor/ceiling or roof/ceiling assembly having a fire-resistance rating ≥ the exterior wall, and the fire separation distance > 10 feet

83 24

83

705.6 Exterior Wall Fire Rating Continuity



84 24

84

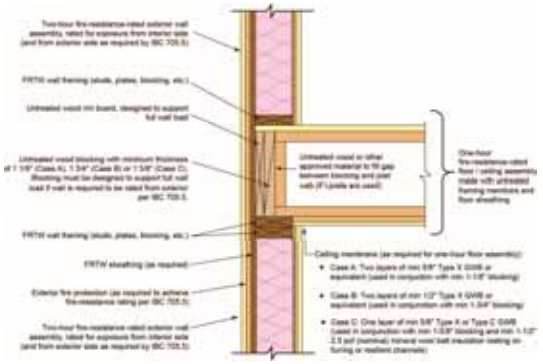
705.7.1 Exterior Wall/Floor Intersections in Type III Construction

- New provisions for load-bearing exterior walls in Type III construction clarify detailing where floors intersect the exterior wall in typical "platform" framing
- Fire-resistance rating of portion of floor assembly that supports exterior wall to be ≥ than the rating required for the exterior wall per Table 601
  - The rating provided by the portion of the floor assembly supporting and within the plane of the exterior wall is permitted to include the contribution of the ceiling membrane when considering exposure from fire to the inside
- Where wall is load-bearing, floor construction within plane of the exterior wall to be in accordance with requirements for interior building elements of Type III construction
  - Includes rim joists, rim boards and blocking

85 24

85

705.7.1 Exterior Wall/Floor Intersections in Type III Construction



86 24

86

706.1.2 Fire Walls—Deemed to Comply

- Use of NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls*, previously recognized as acceptable for dealing with structural stability requirement of IBC
- Fire walls now may be fully designed and constructed in accordance with NFPA 221, except where IBC addresses similar issues
  - For example, NFPA 221 does not contain any requirement for fire wall fire-resistance ratings. Therefore, provisions of IBC Section 706.4 will apply

87 24

87

707.5 Enclosure of Exit Passageways

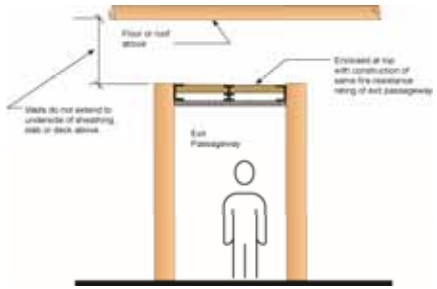
- Allowance now provided for fire barriers creating an exit passageway to terminate at a fire-resistance-rated lid.
  - Enclosure at top to have same fire-resistance rating as required for the exit passageway.
- This new option can be applied where fire barrier does not extend to the underside of the roof sheathing, slab or deck above.
- Permits passage of ducts, piping and conduit from one side of the exit passageway to the other without need for a horizontal shaft enclosure.

88 21

88

707.5 Enclosure of Exit Passageways

- Provision applicable where either floor or roof occurs above the exit passageway enclosure.

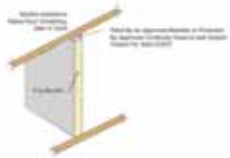


89 21

89

707.9, 715.2, 715.6 Continuity of Head-of-Wall Systems

- Option for protecting voids at the intersection of fire barrier and the underside of nonfire-resistance-rated now provided.
  - Previously, only broad performance-based method was available where filling the void by approved material to retard the passage of fire and hot gases was available.
- Now, performance can also be measured through compliance as an approved continuity head-of-wall system tested per ASTM E2837.
  - System will need to provide an F rating/T rating not less than the required fire-resistance rating of the fire barrier in which it is installed.



90 24

90

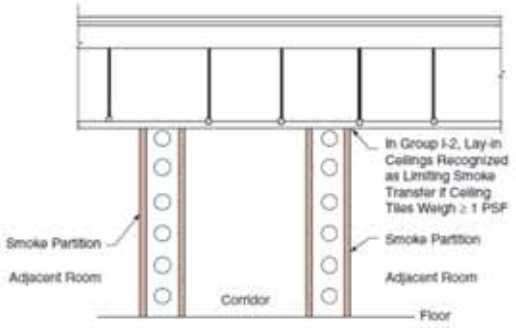
710.4 Continuity of Smoke Partitions

- Lay-in ceiling systems now considered as "capable of limiting the transfer of smoke" where installed in Group I-2 occupancies, provided:
  - Ceiling tiles weigh a minimum of 1 pound/square foot, and
  - HVAC system is fully ducted per IMC Section 603
- Although monolithic ceiling typically considered as the compliant method of construction, such a ceiling type is impractical in hospital and nursing home settings.
  - Main utility and ductwork lines typically run through corridor ceilings to minimize their placement in patient care areas.
- Allowance consistent with federal standards.

91 24

91

710.4 Continuity of Smoke Partitions



92 24

92

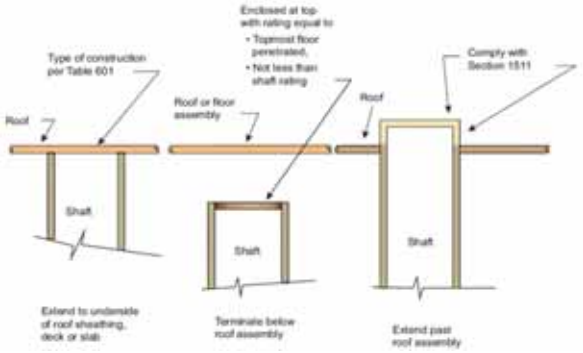
713.12 Top of Shaft Enclosure

- Three specific methods for terminating a shaft enclosure at top have been established to clarify the options that are available:
  - Extend the shaft walls to the underside of the roof sheathing, deck or slab, or
  - Terminate below the roof assembly with a top enclosure having the same fire-resistance rating as the topmost floor penetrated by the shaft but not less that the required rating of the shaft enclosure, or
  - Extend past the roof assembly and comply with the provisions for rooftop structures (penthouses) in Section 1511.

93 21

93

713.12 Top of Shaft Enclosure

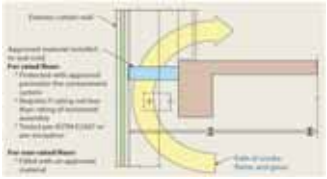


94 21

94

715.4, 715.5 Exterior Curtain Wall and Floor Intersections

- Voids created at intersection of exterior curtain wall assemblies and floor or floor/ceiling assemblies are required to be filled or protected to prevent the interior spread of fire
  - Fire-resistance-rated floor or floor/ceiling assemblies: Protected
  - Nonfire-resistance-rated floor or floor/ceiling assemblies: Filled
- Three new exceptions now provided where such voids do not require protection or filling
  - Floors within a single dwelling unit
  - Floors and ramps within parking garages
  - Mezzanine floors

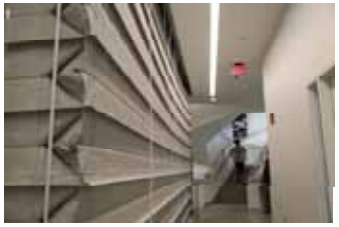


95 24

95

716.4 Fire-Protective Curtain Assemblies

- New definition in Section 202 defining fire-protective curtain assembly as: *an assembly consisting of a fabric curtain, bottom bar, guides, coil, and an operating and closing system*
- New provisions establish guidance on how such assemblies are to be tested, labeled and installed.



96 21

96

716.4 Fire-Protective Curtain Assemblies

- Assemblies to be evaluated using UL 10D, but without hose stream test.
- IBC does not address how or where these systems are to be used or where they would be accepted.
  - It is assumed that the assemblies would typically be installed as a means of smoke and draft control.
- Their use, either vertical or horizontal, will need to be reviewed and approved by the building official under alternate methods provisions of Section 104.11.

97 21

97

717.5.2 Flex Connectors

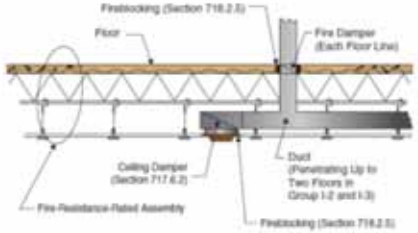
- Under Exception 3, fire dampers may be omitted at penetrations of fire barriers in fully-ducted HVAC systems where specified conditions are met.
- New allowances permit the installation of nonmetal flexible air connectors at two locations:
  - At the duct connection to the air handling unit or equipment located within the mechanical room per IMC Section 603.9.
  - From an overhead metal duct to a ceiling diffuser within the same room per IMC Section 603.6.2.

98 21

98

717.6.1 Through Penetrations for Group I-2 and I-3 Occupancies

- General limitation on through penetration of ducts where penetrating a horizontal assembly now also applicable to Group I-2 and I-3 occupancies.
  - Permits connection of two stories without shaft enclosure where fire damper installed at floor line or duct protected as a penetration per Section 714.5.
- Consistent with MMS federal certification requirements



99 24

99

722.1 Fire-Resistance Rating of Exposed Mass Timber Members

- Fire-resistance rating of mass timber members to be in conformance with Chapter 16 of the *National Design Specification for Wood Construction* (NDS).
- NDS 16.2 addresses fire design up to 2 hours
- Applicable to beams, columns, walls, floors/roofs
- Applicable products include:
  - Sawn lumber
  - Glulam (softwood)
  - LVL
  - PSL
  - LSL
  - CLT

100 21

100

722.1 Fire-Resistance Rating of Exposed Mass Timber Members

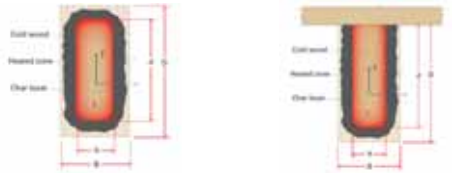


Table 16.2.1A Char Depth and Effective Char Depth (for β_n = 1.5 in./hr.)

Required Fire Resistance (hr.)	Char Depth, a_{char} (in.)	Effective Char Depth, a_{ef} (in.)
1-Hour	1.5	1.8
1½-Hour	2.1	2.5
2-Hour	2.6	3.2

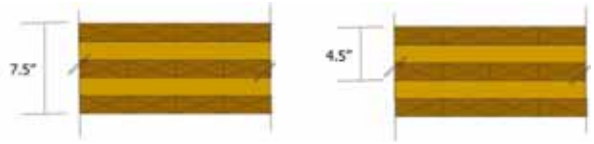
101 21

101

722.7 Fire-Resistance Rating of Mass Timber Assemblies

Example of determination of effective CLT roof cross-section:

- Assume 5-layers @ 1.5" (total = 7.5")
- Determine thickness for 1-hr FRR
- a_{char} = 1.8" (NDS Table 16.2.1B)
- d = 7.5" – 1.8" = 5.7"
- Could conservatively assume 3-layer panel for design



102 21

102

722.7 Fire-Resistance Rating of Mass Timber Assemblies

- A prescriptive approach has been provided to achieve the required fire-resistance ratings for mass timber members and assemblies.
- The fire-resistant rating to consist of the rating of the unprotected mass timber element added to the protection time of the noncombustible protection.
  - At least 2/3 of the required fire-resistance rating must come from the noncombustible protection.
- Provisions address protection on both exterior and interior surfaces.
- The fire-resistance rating of exposed mass timber members is to be in conformance with Chapter 16 of the *National Design Specification for Wood Construction* (NDS).

103 21

103

722.7 Fire-Resistance Rating of Mass Timber Assemblies

TABLE 722.7.1(1) Protection Required from Noncombustible Covering Material

Required Fire-Resistance Rating of Building Element per Tables 601 and 703.5 (hours)	Minimum Protection Required from Noncombustible Protection (minutes)
1	40
2	80
3 or more	120

TABLE 722.7.1(2) Protection Provided by Noncombustible Covering Material

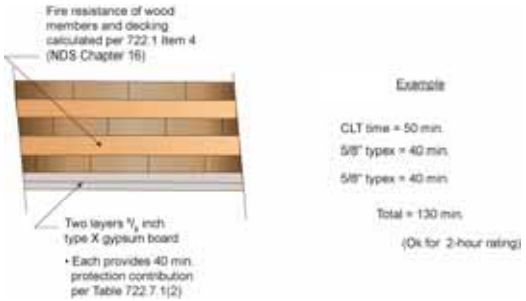
Noncombustible Protection	Protection Contribution (minutes)
½-inch Type X gypsum board	25
⅝-inch Type X gypsum board	40

104 21

104

722.7 Fire-Resistance Rating of Mass Timber Assemblies

- Example:



105 21

105

806.8 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."

106 21

106

903.2 Sprinkler System Required – Lithium-ion and Lithium Metal Batteries

- Sprinkler systems are required in certain Group B, F-1, M and S-1 occupancies where these batteries are involved.
- No longer limited to only ESS areas.
- Addresses the unique fire hazard the batteries create and the potential for a thermal runaway fire.
- Sprinkler system design is based upon fire tests to address specific hazard and arrangement.
  - Does not use standard density requirements for the general occupancy area.
- A number of other provisions have been added throughout IBC and IFC to better address hazards of these types of batteries.

107 24

107

903.2 Sprinkler System Required – Lithium-ion and Lithium Metal Batteries

Occupancy Classification	Use	Extent of Required Sprinkler Protection
Group B	Laboratories involving research, development or testing of LI or LM batteries	Throughout fire area
Group F-1	Manufacture of LI or LM batteries	Throughout the building
	Manufacture of vehicles, energy storage systems or equipment containing LI or LM batteries where batteries installed as part of manufacturing process	Throughout the building
Group M	Storage of LI or LM batteries by IFC Section 320 or IFC Chapter 32	Within the storage room or space
Group S-1	Storage of LI or LM powered vehicles where fire area > 500 sf	Throughout the building
	Repair garage with storage of LI or LM powered vehicles where fire area > 500 sf	Throughout the building

LI = lithium-ion
LM = lithium metal

108 24

108

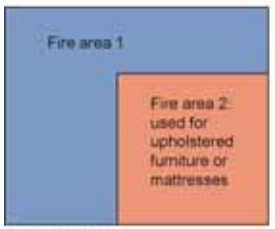
903.2.4.3, 903.2.7.2, 903.2.9.4 Sprinkler Protection of Upholstered Furniture and Mattresses

- Sprinkler requirements 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

109 21

109

903.2.4.3, 903.2.7.2, 903.2.9.4 Sprinkler Protection of Upholstered Furniture and Mattresses



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

110 21

110

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.

111 21

111

903.2.9.4 Group S-1 Self-Storage Facilities

- 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.

112 21

112

903.2.10, #3 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
  - Building has one or more stories with an occupant load ≥ 30 located ≥ 55 feet above lowest level of fire department vehicle access (Section 903.2.11.3)
- 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

113 21

113

903.3.1.1.1, #1 Sprinkler System Exempt Locations

- Two of the locations exempt from sprinkler protection have been consolidated into a single exemption.
- Formerly, sprinkler protection was not required for a room or space where:
  - Application of water, or flame and water, constitutes a serious life or fire hazard, or
  - Sprinklers considered undesirable because of nature of contents.
- New consolidated exemption applies for a room or space "where sprinklers constitute a serious life or fire hazard because of the nature of the contents."

114 24

114

903.3.1.1.3 Automatic Sprinkler Protection for Batteries

- Where automatic sprinkler systems are required by IBC for areas containing lithium-ion and lithium metal batteries, design of system to be based upon series of fire tests.
- Such tests to be conducted or witnessed and reported by an approved testing laboratory.
  - Tests to involve scenarios that address range of variables associated with intended arrange of hazards to be protected.
- NFPA 13 specifically indicates that lithium-ion and lithium metal batteries are not addressed by its general commodity classification provisions, thus no guidance is provided to adequately address hazard.

115 24

115

903.3.1.2 NFPA 13R Sprinkler Protection

- Scoping for the permitted use of an NFPA 13R sprinkler system in Group R occupancies has been modified such that the following conditions must all be met by the Group R to allow for use of 13R system:
  - Located no more than 4 stories above grade plane (previously four stories total), and
  - For other than Group R-2 occupancies, floor level of highest story no more than 30 feet above lowest level (or lowest story below highest level) of fire department vehicle access (previously 60 feet of building height, from grade plane to average height of highest roof surface)..
- In addition, the story limit of four is now to be measured from grade plane in podium buildings (Sec. 510.2 and 510.4) rather than from the horizontal assembly separating the two buildings.

116 21,24

116

903.3.1.2 NFPA 13R Sprinkler Systems

- For Group R-2 occupancies, a maximum height of 45 feet now permitted for use of 13R sprinkler system.
- 45-foot height to be measured from lowest level of fire department vehicle access to eave of highest pitched roof, intersection of highest roof and exterior wall, or top of highest parapet, whichever is greatest height.

117

24

117

903.3.1.2 NFPA 13R Sprinkler Systems

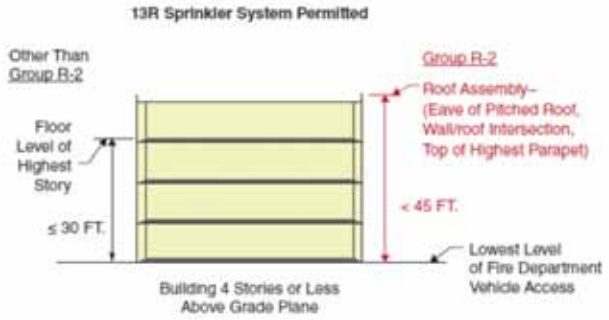
	2018 IBC All Group R buildings	2024 IBC Group R-2 Apartment Buildings only	2024 IBC All Occupancies other than Group R-2
Maximum Number of Stories	4 total	4 above grade plane	4 above grade plane
Maximum Height in Feet	60	45	30
Lower Datum Point for Height in Feet Measurement	Grade plane	Lowest level of fire department vehicle access	Lowest level of fire department vehicle access
Upper Datum Point for Height in Feet Measurement	Average height of highest roof surface	Eave of highest pitched roof, intersection of highest roof and exterior wall, or top of highest parapet, whichever is greatest height	Floor level of highest story
Lower Datum Point for Number of Stories Permitted for Podium Buildings (Sec. 510.2, 510.4)	Horizontal assembly separating upper and lower buildings	Grade plane	Grade plane

118

21,24

118

903.3.1.2 NFPA 13R Sprinkler Systems



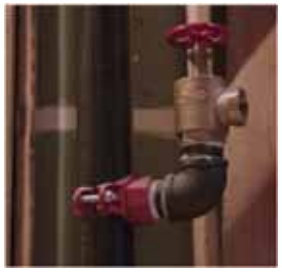
119

21,24

119

905.4 Standpipe Installations

- In addition, the required locations where standpipe hose connections are to be located now includes exterior exit stairways.
  - Previously, connections at stairways were only required for interior exit stairways in buildings requiring a Class I standpipe systems.
  - Addresses intended application of requirement to all required exit stairways where applicable.



120

24

120

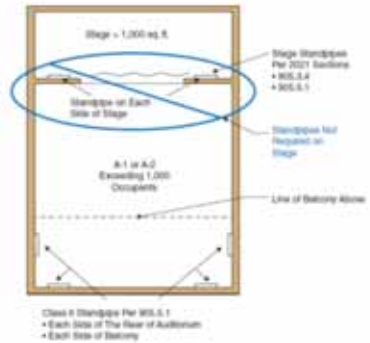
~~905.3.4~~, 905.5.1 Standpipes for Stages

- Class III standpipe system no longer required on both sides of stages over 1,000 square feet in floor area.
  - Previously, both 1½-inch and 2½-inch connections were required, with an exception allowing for only 1½-inch connections if the building or area is provided with sprinkler protection.
- In addition, the requirement for Class II standpipes on each side of stages in Group A-1 and A-2 occupancies has been deleted.
- Deletions based upon:
  - Such buildings now typically sprinklered throughout
  - Very good fire record for such buildings
  - Current thinking recognizes limitations and hazards with building occupants attempting to fight a fire

121 24

121

905.3.4, 905.5.1 Standpipes for Stages



122 24

122

907.2.1 Group A Occupancy Fire Alarms

- Manual fire alarm system or EV/AC system no longer required for Group A-5 outdoor bleacher-type seating where occupant load ≥ 300 and < 15,000 occupants, if:
  - Public address system with standby power provided
  - Any enclosed spaces attached or within 5 feet of seating limited to 10% of seating area or 1,000 square feet, whichever is less
  - Spaces under seating areas to be separated from seating area per Section 1030.1.1.1 (minimum 1-hour construction)
  - All means of egress open to outside

123 24

123

907.2.1 Group A Occupancy Fire Alarms

- Temporary Group A-5 seating facilities also not required to have manual fire alarms system or EV/AC system, if:
  - No enclosed spaces under or attached to bleacher-type seating
  - Seating erected for less than 180 days
  - Evacuation of seating area included in approved fire safety plan
- Both new exceptions provide clarity and remove inconsistent application of requirements.
  - Based on Section 309 of ICC 300 *Standard on Bleachers, Folding and Telescoping Seating and Grandstands*
- Neither pull stations nor occupant notification system required.
- Fire safety plan will require an occupant notification procedure

124 24

124

907.2 Fire Alarm and Detection Systems

- New sections added to require detection systems in areas containing lithium-ion and lithium metal batteries.
- Similar to 903.2, requirements apply to Group B, F, M and S occupancies
- Requires an alarm system activated by air sampling-type smoke detection or radiant energy-sensing detection.
- Helps to prevent/limit fire or thermal runaway hazard by early detection of battery failures
- Since fires are almost impossible to extinguish, this helps detect problems to allow evacuation, or mitigation efforts prior to fire occurrence.

125 24

125

907.2 Fire Alarm and Detection Systems

Occupancy Classification	Use	Extent of Required Fire Alarm Protection
Group B	Laboratories involving research, development or testing of LI or LM batteries	Throughout fire area
Group F-1	Manufacture of LI or LM batteries	Throughout the fire area
	Manufacture of vehicles, energy storage systems or equipment containing LI or LM batteries where batteries installed as part of manufacturing process	Throughout the fire area
Group M	Storage of LI or LM batteries by IFC Section 320 or IFC Chapter 32	Throughout the storage room or space
Group S-1	Storage of LI or LM batteries	Throughout the fire area

Fire alarm system to be activated by an air-sampling-type smoke detection system or a radiant-energy-sensing detection system.

LI = lithium-ion
LM = lithium metal

126 24

126

907.2.10.1 Manual Fire Alarms in Group S Buildings

- Manual fire alarm system now required in Group S public- and self-storage occupancies where both of following conditions occur:
  - Three stories or greater in height, and
  - Interior corridors and/or interior common areas
- Visible notification appliances not required within storage units.
- Manual fire alarms boxes not required where building is fully sprinklered and occupant notification appliances activate throughout notification zones upon sprinkler water flow.

127 21

127

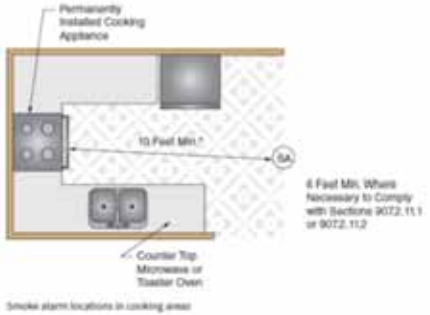
907.2.11.3 Smoke Alarms Near Cooking Appliances

- Modifies the location requirements applicable to smoke alarms due to changes in the listing standard.
- New testing standards help reduce nuisance alarms caused by cooking sources.
  - Align with NFPA 72 and UL 217
- Requires 10-foot horizontal separation to permanently installed cooking appliance, with exception permitting reduction to 6 feet to ensure detectors are installed where required by 907.2.11.1 or 907.2.11.2.
- Code previously used 20 feet, 10 feet or 6 feet, depending on alarm type.

128 24

128

907.2.11.3 Smoke Alarms Near Cooking Appliances



129

24

129

907.5.2.1.3 Audible Alarm Signal Frequency

- In sleeping rooms of Group I-1, R-1 and R-2 occupancies, the audible fire alarm activated by the fire alarm system to now be a 520-Hz low-frequency signal.
  - Where smoke alarm unable to produce a 520-Hz signal, the signal to be provided by a listed notification appliance or smoke detector with an integral 520-HZ sounder.
- Low-frequency signal for smoke alarms only required in Group R-1 or R-2 occupancies required to have a fire alarm system.

130

21,24

130

907.5.2.1.3 Audible Alarm Signal Frequency

- Low frequency signals have been shown to improve the waking effectiveness for several high-risk groups, including:
  - Individuals who are over 65 who are hard of hearing
  - School-age children
  - People who are alcohol impaired
- As there are currently very few smoke alarms capable of providing the low-frequency signal, particularly in back-up mode, other methods include:
  - Fire alarm system horns and horn/strobes
  - Smoke detectors w/integral sounder bases
  - Speakers connected to an EVAC system

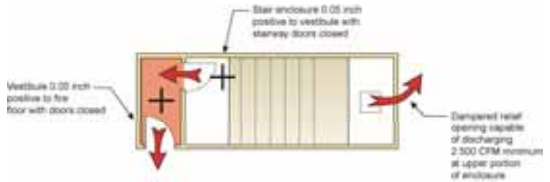
131

21,24

131

909.20 Smokeproof Enclosures

- New method utilizes a pressurized stairway and a pressurized entrance vestibule.
  - In addition, a controlled relief vent is to be located in the upper portion of the pressurized exit enclosure.
- Allows for a combination of existing methods by including a vestibule and using the pressurization between the exit enclosure and the vestibule to minimize smoke entrance into the stairway enclosure.



132

21

132

909.20.5 Smokeproof Enclosures

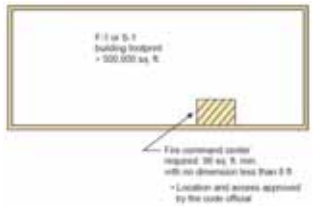
- A fourth option has been added for the construction of smokeproof enclosures.
- Other available methods include:
  - Natural ventilation alternative
  - Mechanical ventilation alternative
  - Stairway pressurization alternative
- Method will work well for high-rise buildings with stack effect conditions due to building height and outdoor air temperatures.
  - May be more effective and/or economical than other methods

133 21

133

911.1 Fire Command Centers in Groups F-1 and S-1

- Fire command center now required in Group F-1 and S-1 occupancies with building footprint > 500,000 square feet.
  - Fire command centers continue to be required for high-rise buildings.
- Fire command center to be ≥ 96 square feet with a minimum dimension of 8 feet where approved by the fire code official.
  - Reduction from general requirement of ≥ 200 square feet and ≥ 10 feet minimum dimension.



134 21

134

915 Carbon Monoxide Detection

- Detection now required in all normally occupied occupancies where a carbon monoxide producing device is present.
- Previously was only required in Group I-1, I-2, I-4 and R occupancies and in classrooms of Group E occupancies.
- An exception exempts detection requirement in F, S and U occupancies that are not normally occupied.
- Requirements have also been substantially revised and reformatted.
- Relies on definition in Chapter 2 which helps limit scope to permanent CO sources or commonly used vehicles (vehicles in garage, propane forklifts, etc.) and not temporary or infrequent sources.

135 24

135

915 Carbon Monoxide Detection

- Carbon monoxide protection to be installed where any of following conditions exist:
  - In buildings that contain a CO source
  - In buildings that contain or supplied by CO-producing forced-air furnace
  - In buildings with attached private garages
  - In buildings having CO-producing vehicle used within the building
- Installation addressed for various locations, including:
  - Dwelling units and sleeping units
  - Group E occupancies
  - Enclosed rooms served by fuel-burning, forced air furnace
  - Private garages
  - Locations not specifically addressed

136 24

136

Part 4

Means of Egress

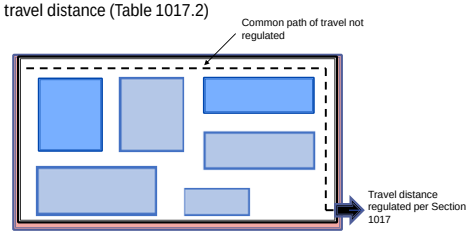
- Chapter 10 Means of Egress

137

137

1006.2.1 Egress from Mechanical Rooms and Penthouses

- Common path of travel distance limitations are no longer applicable to unoccupied mechanical rooms and penthouses.
- These limited use spaces continue to be regulated based on:
  - Occupant load (Table 1006.2.1)
  - Exit access travel distance (Table 1017.2)



138

21

138

1006.3 Egress from Stories and Occupiable Roofs

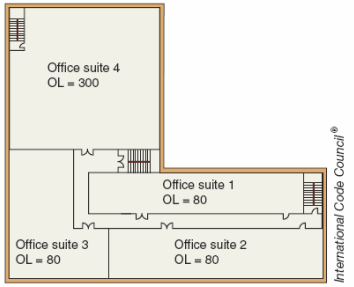
- Language modified to clarify that occupants to be provided with options for egress from upper stories by requiring access to minimum number of required exits for both their location and occupant load served.
- On upper stories, occupants from any space must have access to the minimum required number of exits for the story or occupiable roof.
  - However, access to all exits from the story or occupiable roof may not necessarily be required.

139

24

139

1006.3.3 Egress from Stories and Occupiable Roofs



Exits serving specific spaces or areas

140

24

140

Tables 1006.3.4(2) and 1006.3.4(2) Egress from Stories and Occupiable Roofs

- Thresholds for allowance of a single means of egress from an occupiable roof have been established
- For Group R-2 apartment buildings, single exit or access to single exit permitted from occupiable roof over first or second story above grade plane
  - Limited to roofs accessed through and serving individual dwelling unit
- For all other occupancies, single exit or access to single exit permitted from occupiable roof over first story above grade plane

141 24

141

Tables 1006.3.4(2) and 1006.3.4(2) Egress from Stories and Occupiable Roofs

TABLE 1006.3.4(1) Stories and Occupiable Roofs With One Exit or Access to One Exit for R-2 Occupancies

Story or Occupiable Roof	Occupancy	Maximum Number of Dwelling Units	Maximum Exit Access Travel Distance
Basement, first, second or third story above grade plane and occupiable roofs over the first or second story above grade plane	R-2[a,b,c]	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP = Not Permitted.
NA = Not Applicable.
a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1031.
b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.4(2).
c. This table is for occupiable roofs accessed through and serving individual dwelling units in Group R-2 occupancies. For Group R-2 occupancies with occupiable roofs that are not access through and serving individual units use Table 1006.3.4(2).

142 24

142

Tables 1006.3.4(2) and 1006.3.4(2) Egress from Stories and Occupiable Roofs

TABLE 1006.3.4(2) Stories and Occupiable Roofs With One Exit or Access to One Exit for Other Occupancies

Story and Occupiable Roofs	Occupancy	Maximum Occupant Load Per Story and Occupiable Roof	Maximum Exit Access Travel Distance (Feet)
First story above or below grade plane and occupiable roofs over the first story above grade plane	A, B[a], E, F[a], M, U	49	75
	H-1, H-3	3	25
	H-4, H-5, I, R-1, R-2[b,c]	10	75
	S[a,d]	29	75
Second story above grade plane	A, F, M, S[a]	29	75
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP = Not Permitted.
NA = Not Applicable.
a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1031.
b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an occupiable roof of such buildings shall have a maximum exit access travel distance of 220 feet.
c. This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1006.3.4(1).
d. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 220 feet.

143 24

143

1008 Means of Egress Illumination

- Means of egress illumination no longer required in self-storage units where:
  - Units do not exceed 400 square feet in floor area, and
  - Units are accessed directly from exterior of building.
- Allowance recognizes:
  - Lack of electrical power/lighting in units to reduce hazards and discourage use for non-storage purposes
  - Applicable where size does not exceed that of a typical two-vehicle garage
  - Opening directly to exterior provides for familiar means of egress
- Section 1008 also reorganized to separate provisions for general means of egress illumination from those addressing emergency or back-up illumination.

144 24

144

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

145 21

145

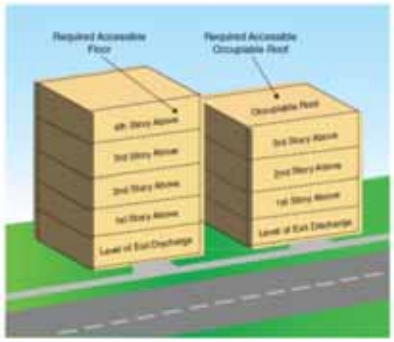
1009.2.1 Elevator Required for Accessible Means of Egress

- Scoping provisions clarified for accessible means of egress for an occupiable roof.
- As a general rule, required accessible means of egress to include a complying elevator where an accessible occupiable roof is located above a story that is three or more stories above level of exit discharge.
  - Consistent with consideration of occupiable roof as a floor level for accessible means of egress purposes.

146 21,24

146

1009.2.1 Elevator Required for Accessible Means of Egress



147 21,24

Accessible Elevator Required in Both Buildings

147

1009.2.2 Maneuvering Clearances at Accessible Means of Egress Doors

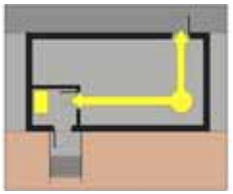
- Required maneuvering clearances at doorways along routes serving as accessible means of egress, including stairways, have been clarified.
- Where doors are part of an accessible route to provide access to an exit, area of refuge or exterior area of assisted rescue:
  - Maneuvering clearances to be provided at such doors in direction of egress.
- Where doors lead to an area of refuge or exterior area for assisted rescue and reentry to the floor is possible:
  - Door maneuvering clearances to be provided on both sides of door.
- Maneuvering clearances not required at doors to exit stairways for levels above and below exit discharge level where exit enclosure does not include an area of refuge.

148 24

148

1009.6.2 Areas of Refuge

- An interior area of refuge no longer needs to have direct access to a complying stairway or elevator where the area of refuge:
  - Is located at the level of exit discharge, and
  - Provides direct access an exterior exit door.
- Allows for an alternative to an exterior area for assisted rescue which is typically utilized where the exit discharge is not accessible.



149 21

149

1010.2.4, #2 Locks and Latches

- In Group I-1, Condition 2 and Group I-2 occupancies where clinical needs of care recipients require containment, or where such persons pose a security threat, locks and latches are permitted to prevent door operation where:
  - All clinical staff can readily unlock doors at all times, and
  - All such locks are keyed to keys carried by clinical staff at all times, or clinical staff have codes or other means necessary to operate the locks at all times.
- Consistent with federal healthcare regulations
- Locking devices now also permitted on doors to balconies, decks and other exterior spaces serving:
  - Private office spaces where exterior space ≥ 250 sf
  - Individual dwelling or sleeping units

150 21

150

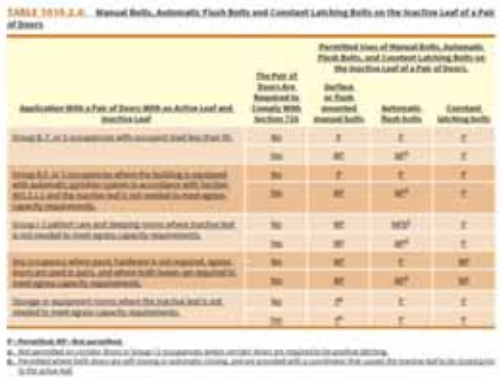
1010.2.4, #4 Locks and Latches

- Adds four definitions (automatic flush bolt, constant latching bolt, dead bolt, and manual bolt)
- Reformats provisions and provides a table to clarify which type of latching bolt is permitted in various applications.
- Modifies existing "main door" exception to clarify it as being the main door into the building or tenant space and excludes secondary doors.
- Eliminates the occupant load limit of 10 for dwelling units or sleeping units to use night latch, dead bolt or security chain.
  - Now permitted for units permitted a single means of egress.

151 24

151

1010.2.4, #4 Locks and Latches



152 24

152

1010.2.4, #8 Locks and Latches

- Where occupants must egress from an exterior space through the building, exit access doors permitted to equipped with an approved locking device.
  - Applicable to enclosed courtyards, occupied roofs, decks and other exterior areas
  - Not applicable to egress courts
- Six conditions must be met in order for the locking devices to be permitted:

153 21

153

1010.2.4, #8 Locks and Latches

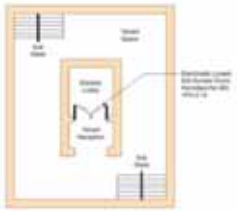
- Conditions include:
  - Maximum occupant load posted per Section 1004.9 inside building adjacent to all exit access doorways
  - Weatherproof telephone or two-way communication system installed on exterior side adjacent to at least one required exit access door
  - Locking device to be key-operated and readily distinguishable as locked
  - Minimum 5 square-foot clear window or glazed door opening provided at each exit access door
  - Signage posted on interior side at each locked door stating "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED"
  - Occupant load of exterior area limited to 300

154 21

154

1010.2.14 Elevator Lobby Exit Access Doors

- Permits electronically locked exit access doors to serve as the means of egress from an elevator lobby.
- Eliminates the need for an elevator lobby to have direct access to an exit and allow the egress path to go through a tenant space which could normally be locked and unavailable.
- Requires eight conditions to be met, including:
  - NFPA 13 sprinkler system
  - Fire alarm system
  - Smoke detection system in lobby
  - Other occupants of floor to have access to two exits without travel through lobby
  - Two-way communication system within the lobby

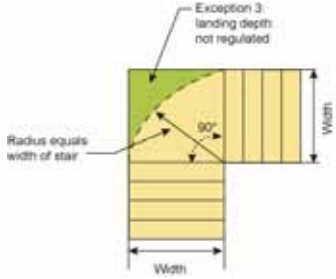


155 24

155

1011.6 Stairway Landings

- Where landing turns 90° or more, minimum landing depth not regulated where landing provided is not less than that described by an arc with a radius equal to width of the flight served.



156 21

156

1013.2 Low-level Exit Signs in Group R-1

- New exception eliminates the requirement for low-level exit signs in areas serving the guestrooms of Group R-1 occupancies when the building is sprinklered.
  - The exception requires either an NFPA 13 or 13R system throughout the building.
- These additional exit signs were not felt to be justified based on many improvements in the fire safety record of Group R-1 occupancies. This includes compartmentation, sprinklers, alarms and loss history.

157 24

157

1014.3 Lateral Location of Handrails

- Handrails to be located 6 inches or less horizontally from edge of walking surface of stairways, ramps, stepped aisles and ramped aisles.
  - Location limitation will increase reach access for various-sized users as well as increase support and usability of rail.

158 24

158

1014.7, 1014.8 Handrail Extensions and Clearance

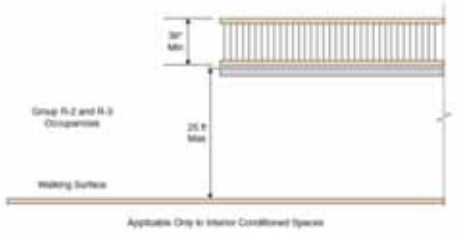
- Clarifications have been made to measurement methods for handrail extension length, including at:
  - Top landing nosing rather than at top riser
  - Bottom tread nosing rather than at bottom riser
- Required minimum length before change in direction or decrease in required clearance also clarified.
- Two new exceptions to requirement of required 1½-inch clearance between handrail and wall reflects current practice and allows for:
  - Decreased clearance due to curvature or angle of handrail return
  - Maximum ½-inch-thick mounting flanges at ends of handrails

159 24

159

1015.3, #2 Guard Height

- Minimum guard height in Group R-2 and R-3 occupancies now permitted to be reduced to 36 inches under specified conditions:
  - Open-side of walking surface not more that 25 feet above floor or walking surface below
  - Limited to areas within interior conditioned space of individual dwelling units
- Allowance available to buildings of any height.



160 24

160

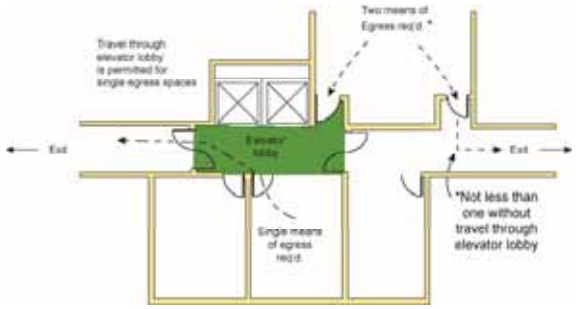
1016.2, #1 Egress Through Intervening Spaces

- Egress through an enclosed elevator lobby now permitted for spaces having a single means of egress.
- Previous language mandated that access to not less than one of required exits to be provided without travel through an enclosed elevator lobby.
  - Such requirement still applicable to spaces where two or more means of egress are required
- Applicable for both nonrated and rated corridors

161 21

161

1016.2, #1 Egress Through Intervening Spaces

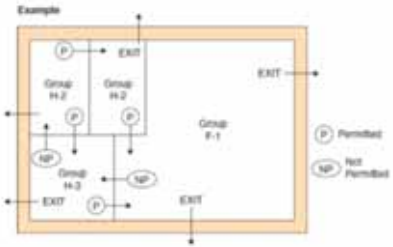


162 21

162

1016.2, #3 Egress Through Intervening Spaces

- Where travel through intervening rooms includes one or more Group H occupancies, limitations on travel have been clarified.
- Egress travel from a room or space classified as a Group H occupancy permitted through an adjoining or intervening room of same or lesser hazard.



163 24

163

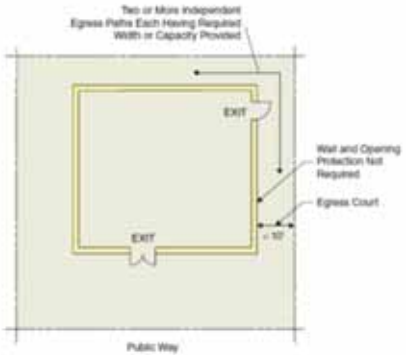
1029.3 Egress Courts – Wall and Opening Protection

- New Exception 3 eliminates the egress court requirements for a fire-resistance-rated wall and protected openings when the occupants have multiple egress path options.
- With options, it is unlikely that both egress paths would be blocked.
- Conceptually similar to existing exception permitted for egress balconies in Section 1021.2.
- Walls with limited fire separation distance would still require protection based on those requirements, but not necessarily based on the egress court protection requirement.

164 24

164

1029.3 Egress Courts – Wall and Opening Protection



165 24

165

1030.16 Handrails at Social Stairs

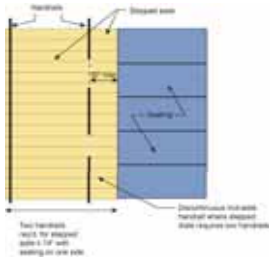
- Guidance has been provided to address handrails on those stairs, primarily in assembly and educational occupancies, that are a combination of stairway travel and assembly seating.
- Based on the assembly stepped aisle provisions, the condition is viewed as an assembly seating area with the seating platforms (without seats) located to the side of the stepped aisle.

166 21

166

1030.16 Handrails at Social Stairs

- Where the stepped aisle has seating on one side and the aisle width is at least 74 inches, two handrails are required (with at least one within 30 inches of the stepped aisle).
  - Where the stepped aisle is required to have two handrails, mid-aisle handrails to be discontinuous.



167 21

167

1030.16 Handrails at Social Stairs – Example

168 21

168

1030.16 Handrails at Social Stairs – Example

Possibly compliant

169

21

169

1030.16 Handrails at Social Stairs – Example

170

21

170

1030.16 Handrails at Social Stairs – Example

171

21

171

Part 5

Accessibility

- Chapter 11 Accessibility and Usability

172

172

1102 Accessible Design Compliance

- The ICC A117.1 standard as referenced by the IBC for the design and construction of accessible buildings and facilities has been updated from the 2009 edition to the 2017 edition.
- Many of the major revisions are addressed in the ICC publication *Significant Changes to the ICC A117.1 Accessibility Standard*, 2017 Edition, including:
  - Enhanced dimensions for clear floor spaces and turning spaces.
  - Modifications to exterior routes, curb cuts, blended transitions, detectable warnings, passenger drop-offs and parking facilities.

173 21

173

1105.1.1 Power-operated Doors at Public Entrances

- In specified occupancies with sizable occupant loads, accessible public entrances must now be provided with an automatic door.
- Power-operated door requirements address entrances with multiple doors, tenant entrances and mixed-occupancy buildings.
- Tenant space with its own exterior public entrance to be considered a separate facility.

174 21,24

174

1105.1.1 Power-operated Doors at Public Entrances

- In facilities with occupant loads exceeding those required by Table 1105.1.1 for occupancies indicated:
  - Each public entrance required to be accessible have a minimum of one power-operated or low-energy power-operated door.
  - Where doors in a series such as a vestibule, at least one set of two doors in series must comply.

TABLE 1105.1.1 Public Entrance with Power-Operated Door[a]

Occupancy	Building Occupant Load Greater Than
A-1, A-2, A-3, A-4	300
B, M, R-1	500

175 21,24

175

1105.1.1 Power-operated Doors at Public Entrances

- Requirements not applicable to mixed-occupancy facilities where total building occupant load for listed occupancies is calculated such that:
  - $AOLO_1/BOLO + AOLO_2/BOLO \ldots < 1.0$

Where:
$AOLO_1$ = Actual occupant load of occupancy 1
$AOLO_2$ = Actual occupant load of occupancy 2
BOLO = Building occupant load threshold of each occupancy per Table 1105.1.1

EXAMPLE:

B occupancy limit: 500
A-2 occupancy limit: 300
350/500 + 60/300 = 0.7 + 0.2 < 1.0
Section 1105.1.1 does not apply

176 21,24

176

1106.3 Accessible Parking for Groups R-2, R-3 and R-4

- Clarifies that accessible parking requirements for Group R-2, R-3 and R-4 occupancies to be based on "the greatest number" of either the 2% requirement or at least one space for each Accessible and Type A unit.
- Code previously was not clear how to apply these two provisions so often was interpreted as providing a choice to use one or the other.
- Group I-1 and R-1 (previous Item 2) removed from this section since they must provide accessible parking per Table 1106.2.

177 24

177

1106.7.1 Accessible Parking for Groups R-2, R-3 and R-4

- Previous item 4 of Section 1106.2 moved to "location" requirements of Section 1106.7.1.
- Requires accessible parking be provided beneath the building if any parking is provided beneath the building.
- Previously applicable to only Group I-1, R-1, R-2, R-3 and R-4 occupancies, scope has been expanded for application to all occupancies.

178 24

178

1107.2 Electrical Vehicle Charging Stations

- New scoping provisions now require electrical vehicle charging stations to meet limited accessibility criteria.
  - Charging stations provided to serve Group R-3 and R-4 occupancies are not required to comply.
- To be viewed as a "service" rather than a parking space
- Neither the IBC nor ICC A117.1 mandate the installation of such stations, but if they are provided they must comply with limited accessibility requirements:
  - Minimum of 5% of vehicle spaces on site, but not less than one of each type of system, shall be accessible.
  - Where charging stations are located at multiple locations on sites, accessible charging stations are not necessarily required at each location.

179 21,24

179

1107.2 Electrical Vehicle Charging Stations

- Electrical vehicle charging stations not required to be accessible where used exclusively by:
  - Buses
  - Trucks
  - Other deliver vehicles
  - Law enforcement vehicles
  - Motor pools
- Type of equipment typically not compatible with that used for standard passenger vehicles.
- Motor pools and similar fleet vehicle areas expected to providing charging stations based on specific need.

180 24

180

1107.2 Electrical Vehicle Charging Stations

- Accessible vehicle spaces to comply as for a van accessible parking space, with:
  - 132 inches minimum width, and
  - Minimum 60-inch-wide access aisle.
- In addition, applicable provisions of ICC A117.1 Section 502 must be met, including:
  - Access aisle
  - Floor surface
  - Vertical clearance
- A117.1 Section 502.11 specific to vehicle charging stations addresses:
  - Operable parts
  - Accessible route
  - Obstructions

181

21,24

181

1108.5, 1110.2 Assisted Toileting and Bathing

- Changes have been made to the provisions for nursing homes and assisted living facilities to allow some units to have toilet and bathing facilities designed for assisted use.
  - These allowances are permitted instead of the independent use facilities generally intended by the ICC A117.1 Accessible unit provisions.
- Both scoping and technical provisions are provided in IBC.
- The assisted use provisions are optional and can be applied when desired by the designer.
  - Units may be modified for toileting, bathing or both

182

21

182

1108.5, 1110.2 Assisted Toileting and Bathing

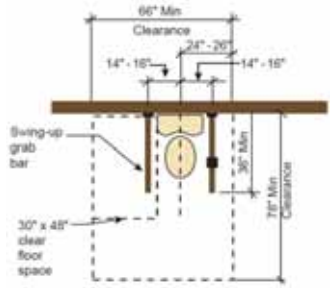
- Assisted water closets and roll-in-type showers may replace like fixtures in up to **50**% of Accessible units in the following occupancies:
  - Group I-1, Conditions 1 and 2
  - Group I-2 rehabilitation facilities
- Assisted water closets and roll-in-type showers may replace like fixtures in up to **90%** of Accessible units in the following occupancies:
  - Group I-2 nursing homes

183

21

183

1108.5, 1110.2 Assisted Toileting



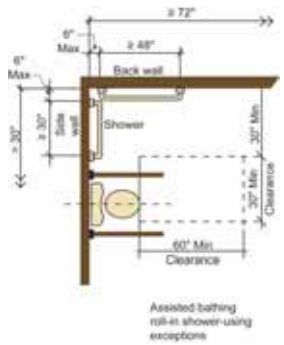
- Primary technical changes include:
  - Increased clearance around water closet of 66" with clearance of 24" to 26" from centerline of fixture
  - Increased clearance depth of 78" to allow for additional approach options
  - Allowance for swing-up grab bars that are typically only permitted in Type B units
  - Toilet paper dispenser to be installed on at least one of the swing-up grab bars

184

21

184

1108.5, 1110.2 Assisted Bathing



Assisted bathing roll-in shower-using exceptions

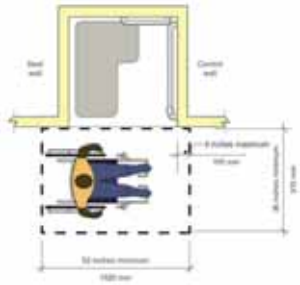
- Primary technical change is elimination of required folding seat
- Allows for use of rolling chair when necessary
- Sidewall and backwall grab bars now differ, with side-wall bar required on 'seat wall' and both grab bars starting in corners

185 21

185

1108.6.1.1 Group R-1 Accessible Units

- New exception permits more limited bathing options where none of the Accessible units in the building contain bathtubs.
- Where NONE of the units within the building contain tubs, standard or alternate roll-in showers with seats are permitted.
- Maintains concept that people with disabilities to be provided with same options as other occupants.
- A second exception allows transfer showers to be substituted for all but the minimum number of roll-in showers from Table 1108.6.1.1

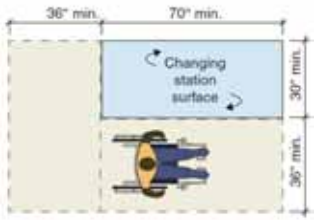


186 24

186

1110.4 Adult Changing Stations

- Adult changing stations to be accessible:
  - Where required by Section 1110.4.1
  - Where provided, even if not required by IBC
- Such stations required for:
  - Assembly and mercantile with aggregate of 6 or more male and female required water closets
  - Group B education facilities with aggregate of 12 or more male and female required water closets
  - Group E with an assembly room or space that requires an aggregate of 6 or more male and female water closets for that room
  - At highway rest stops and highway service plazas



187 24

187

1110.4 Adult Changing Stations

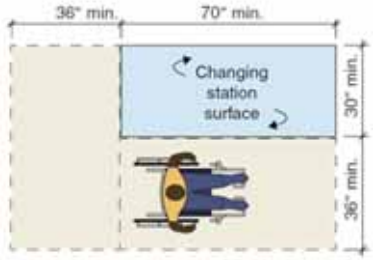
- Required to be located in a single occupant toilet room or in a family or assisted use toilet room
- Prohibited from requiring travel through a security checkpoint from the general separate-sex toilet and bathing rooms
- Located on accessible route
- Person to be within two stories and 2,000 feet of travel
- Water closet and lavatory within the room can be included to satisfy the occupancy's overall fixture requirements

188 24

188

1110.4 Adult Changing Stations

- ICC A117.1-2017 Supplement 1 available as pathway to technical compliance with accessible adult changing station requirements in 2024 IBC
  - ANSI approval pending
- Supplement 1 addresses three general issues:
  - Installation location
  - Room configuration
  - Changing surface



189 24

189

1110.6 Laundry Equipment

- Requirements for accessible laundry equipment relocated from appendix into body of IBC.
- Where three or fewer washing machines provided, at least one to be accessible.
  - Where four or more washing machines provided, at least two to be accessible.
- Where three or fewer clothes dryers provided, at least one to be accessible.
  - Where four or more clothes dryers provided, at least two to be accessible.
- Applicable to laundry equipment provided in public or common-use areas, including laundromats and shared laundry rooms in dormitories and apartment buildings.

190 24

190

1110.6 Laundry Equipment

- Technical requirements located in ICC A117.1-2017 standard, Section 611:
  - Clear floor space — Section 611.2
  - Operable parts — Section 611.3
  - Height — Section 611.4

191 24

191

1112.6 Tactile Room Identification Signs

- Provisions for tactile signage for interior and exterior signs identifying permanent rooms and spaces moved from Appendix Section E107.2.
  - Technical requirements for signage found in A117.1-17 Section 703
- Insertion into Chapter 11 results in no requirement for specific adoption
- Also clarifies that tactile signage only required “where provided”

192 24

192

Part 6

Building Envelope, Structural Systems and Materials

- Chapter 12 Interior Environment
- Chapter 14 Exterior Walls
- Chapter 15 Roof Assemblies and Rooftop Structures
- Chapter 16 Structural Design
- Chapter 17 Special Inspections and Tests
- Chapter 18 Soils and Foundations
- Chapter 19 Concrete
- Chapter 21 Masonry
- Chapter 22 Steel
- Chapter 23 Wood

193

193

1207 Enhanced Classroom Acoustics

- In Group E occupancies, enhanced classroom acoustics shall be provided in all classrooms having a volume of 20,000 cubic feet or less.
- Intended to apply to standard-sized self-contained classrooms, but not larger spaces for activities such as band or choir.
  - Also not intended to apply to ancillary spaces, such as individual tutoring rooms, corridors, or a cafeteria.
- Good acoustics are essential to support language acquisitions and learning for all children.
- Assistive technologies typically only amplify the teacher and do not amplify discussions between students or between teacher and individual student.

194

21

194

1207 Enhanced Classroom Acoustics

- Such acoustics to be in compliance with Section 808 of ICC A117.1, including regulation of:
  - Reverberation times based on either the performance method or prescriptive method
  - Ambient sound levels from sources both inside and outside of the classroom
- In addressing reverberation times, both performance and prescriptive methods are available.
- Ambient sound levels not to exceed 35 dBA and 55 dBC

195

21

195

1406.10 Metal Composite Material (MCM) Cladding

- Metal composite materials (MCM) and systems installed on buildings of Type I, II, III and IV construction are now regulated based upon one of two conditions:
  - Such installations that are over 40 feet above grade plane must comply with:
    - Surface-burning characteristics
      - Flame spread index $\leq$ 25
      - Smoke developed index $\leq$ 450
    - Thermal barrier separation
      - Minimum ½" gypsum board or test per NFPA 275
    - Acceptance criteria of NFPA 285
      - Addresses exterior nonload-bearing wall assemblies containing combustible components
  - Such installations that do not exceed 40 feet above grade plane need only comply with surface-burning characteristics and thermal barrier separation.

196

21

196

1406.10 Metal Composite Material (MCM) Cladding

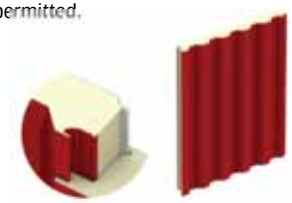
- Previously, all MCM cladding on buildings of other than Type V to meet all three conditions, or meet alternative conditions of Section 1406.11
- Allowance for use of alternative conditions has been deleted, thus removing issues addressing:
  - Fire separation distance
  - MCM surface area limitation and separation
  - Sprinkler protection throughout building
- Modification addresses any confusion in the various requirements, as well as eliminating allowances previously provided where building is sprinklered.

197 21

197

1409 Insulated Metal Panels (IMP)

- New provisions now regulate the materials, construction and quality of insulated wall panels (IMP) used as exterior walls and exterior wall coverings.
- Provisions vary based upon whether insulating materials are combustible or noncombustible.
- Although regulated similar to MCMs, they need their own provisions due to variety of insulating materials that are permitted.



198 24

198

1504.8 Aggregate-Surfaced Roofs

- Minimum parapet heights have been established for aggregate-surfaced roofs to prevent blow-off.
- New Table 1504.8 now mandates minimum heights based on:
  - Aggregate size
  - Mean roof height
  - Wind exposure
  - Basic design wind speed
- Provides engineering and scientific basis for roof design to prevent blow-off based on wind tunnel tests and subsequent field studies of hurricane damage.

199 21

199

1504.8 Aggregate-Surfaced Roofs

- Past provisions were not based on a quantitative analysis of observed roofing system performances on real wind events, but rather variations in surface pressure with building height
- Table 1504.8 previously either permitted or prohibited aggregate used as surfacing for roof coverings or ballast solely based on:
  - Maximum mean roof height
  - Design wind load
  - Exposure category
- Parapets always required

200 21

200

1504.8 Aggregate-surfaced Roofs

TABLE 1504.8 Minimum Required Parapet Height (inches) for Aggregate Surfaced Roofs[a,b,c]

Aggregate Size	Mean Roof Height (ft)	Wind Exposure and Basic Design Wind Speed (mph)																		
		Exposure B										Exposure C[d]								
		≤95	100	105	110	115	120	130	140	150	≥90	100	105	110	115	120	130	140	150
ASTM D1863 (No.7 or No.67)	15	2	2	2	2	12	12	16	20	28	2	12	15	19	23	28	37	51	67
	20	2	2	2	2	12	14	18	22	30	12	15	17	21	25	30	39	54	71
	30	2	2	2	13	13	17	21	25	34	14	17	19	23	28	33	43	59	78
	50	12	12	14	16	16	21	25	30	39	17	19	22	25	30	36	47	64	84
	100	14	16	18	21	24	27	32	37	47	21	24	26	29	32	38	49	67	88
	150	17	19	22	25	27	30	36	41	52	23	26	29	32	35	38	50	68	90
ASTM D1863 (No.81)	15	2	2	2	2	12	12	12	15	18	2	2	2	13	15	17	22	30	39
	20	2	2	2	2	12	12	13	17	21	2	2	12	15	17	19	25	34	44
	30	2	2	2	2	12	12	19	20	24	2	12	14	17	19	21	28	38	49
	50	12	12	12	13	14	18	20	24	29	12	15	17	19	22	24	32	43	56
	100	12	12	13	15	19	21	28	30	35	16	18	21	23	26	29	38	51	67
	150	12	14	17	19	22	24	29	34	39	19	22	24	26	29	32	42	57	74

[a] Where the minimum required parapet height is indicated to be 2 inches, a gravel stop shall be permitted and shall extend not less than 2 inches from the roof surface and not less than the height of the aggregate.

201 21

201

Table 1604.5 Risk Categories – Power & Utilities

Risk Category	Nature Of Occupancy
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Power-generating stations with individual power units rated 75 MW_{AC} (megawatts, alternating current) or greater, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV.
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to: • Public utility facilities providing power generation, potable water treatment, or wastewater treatment.

- No definition for power-generating stations → threshold established
- Public utilities are RC IV → others RC III

202 24

202

T1604.5 Risk Categories – Group I-2, Condition 2 & Group I-3

Risk Category	Nature Of Occupancy
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • ~~Group I-2, Condition 1 occupancies with 50 or more care recipients~~ • ~~Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities~~ • Group I-3, Condition 1 occupancies
IV	Buildings and other structures designated as essential facilities and buildings where loss of function represents a substantial hazard to occupants or users, including but not limited to: • Group I-2, ~~Condition 2~~ occupancies ~~having emergency surgery or emergency treatment facilities~~ • Group I-3 occupancies other than Condition 1 **Errata**

- Only hospitals w/emergency services in RC IV → all hospitals to RC IV
- Nursing homes w/≥ 50 care recipients in RC III → all nursing homes to RC II
- All jails/prisons in RC III → jails/prisons other than Condition 1 in RC IV

203 24

203

Chapter 16 Structural Design Loads

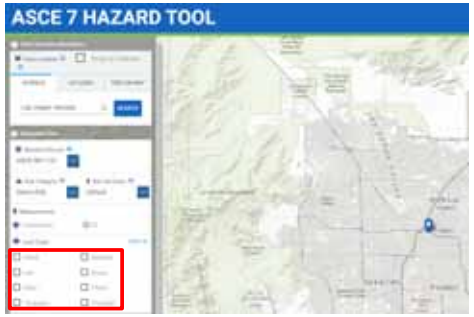
- Updated loads
  - Snow
  - Wind
  - Rain
  - Seismic
  - Guards and handrails
- Tornado loads – new
  - RC III & IV
- Elevators & Escalators
  - Wind
  - Snow
  - Seismic

204 24

204

ascehazardtool.org

- Environmental Loads
  - Free resource
  - Geo coordinates
  - ASCE 7-10, 7-16, 7-22
  - Risk Category
    - All environmental loads now based on risk category



205

205

1608.2 Ground Snow Loads

The ground snow *loads* to be used in determining the design snow *loads* for roofs shall be determined in accordance with the reliability-targeted (strength based) ground snow load values in Chapter 7 of ASCE 7 or Figures 1608.2(1) ~~and 1608.2(2)~~ through 1608.2(4) for the contiguous United States and Table 1608.2 for Alaska. Site-specific case studies shall be determined in accordance with Chapter 7 of ASCE 7 and shall be *approved* by the *building official*. ~~made in areas designated "CS" in Figures 1608.2(1) and 1608.2(2). Ground snow *loads* for sites at elevations above the limits indicated in Figures 1608.2(1) and 1608.2(2) and for all sites within the CS areas shall be *approved*. Ground snow *load* determination for such sites shall be based on an extreme value statistical analysis of data available in the vicinity of the site using a value with a 2-percent annual probability of being exceeded (50-year mean recurrence interval).~~ Snow loads are zero for Hawaii, except in mountainous regions as *approved* by the *building official*.

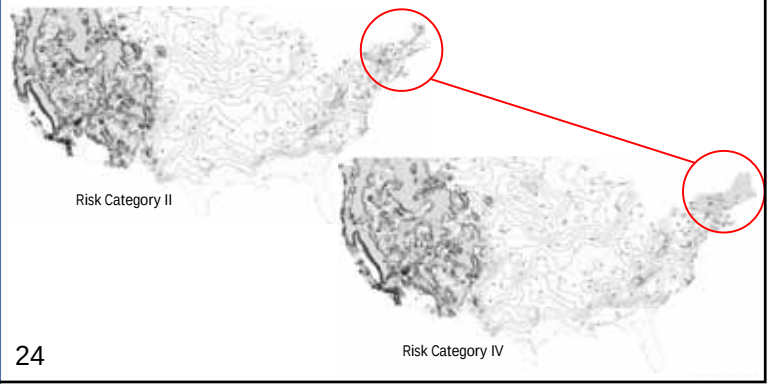
- New maps based on risk category
- Based on 30-years of new data

24

206

206

Figures 1608.2(2&4) – Ground Snow Load Maps

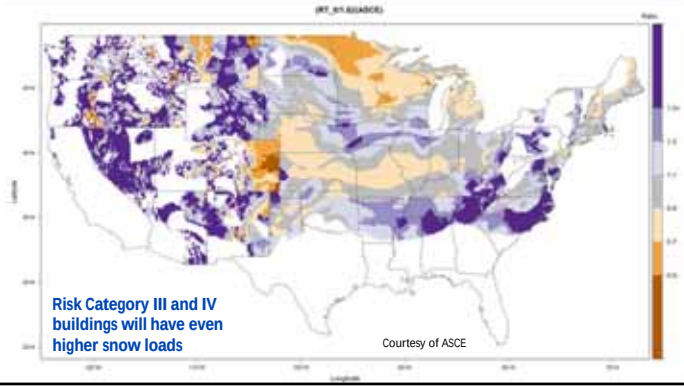


24

207

207

GSL Comparison – Risk Category II (2024/2021)



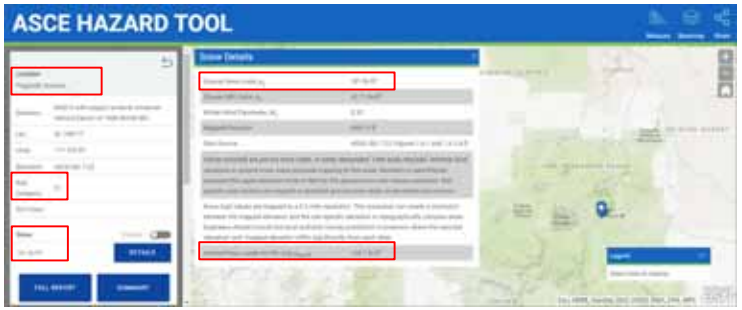
Risk Category III and IV buildings will have even higher snow loads

Courtesy of ASCE

208

208

ascehazardtool.org



209

209

1609.5 Tornado Loads

The design and construction of Risk Category III and IV buildings and other structures located in the tornado-prone region as shown in Figure 1609.5 shall be in accordance with Chapter 32 of ASCE 7, except as modified by this code.

- Risk Category III and IV buildings
- Tornado-prone region
- New ASCE 7 Chapter 32
- Tornado speeds from maps or ASCE 7 hazard tool

24

210

210

1609.5 Tornado-prone Region

24

211

211

Why is this important?

Reported tornadoes from 1995 to 2016

Scale	Wind Speed (mph)	Damage
EF0	65–85	Light damage
EF1	86–110	Moderate damage
EF2	111–135	Considerable damage
EF3	136–165	Severe damage
EF4	166–200	Devastating damage
EF5	>200	Incredible damage

89%

97%

Enhanced Fujita (EF) Scale

212

212

Not for Storm Shelter Design

... A building or other structure designed for tornado loads determined exclusively in accordance with Chapter 32 **cannot be designated as a storm shelter without meeting additional critical requirements** provided in the applicable building code and ICC 500, the ICC/NSSA *Standard for the Design and Construction of Storm Shelters*...

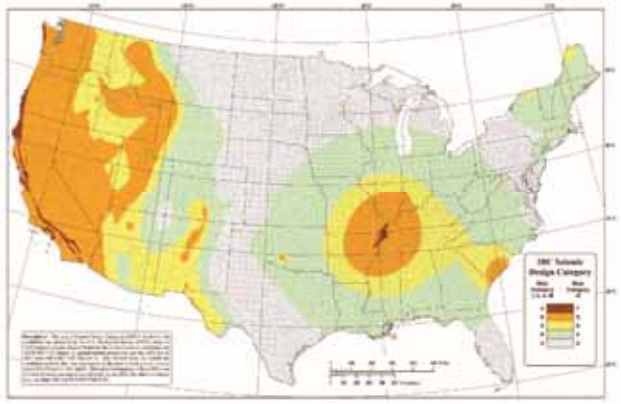
ASCE 7-22 § 32.1.1

213

213

1613.2 Seismic Design Categories (SDC)

- Calculations not needed
- Map lookup or ASCE 7 tool
- Creates very simple approach in IBC



IBC Figures 1613.2.1(1) & (2) Western and Eastern U.S.

24

214

214

1704.6 Structural Observations

- Two new classes of structures are now required to be provided with structural observation:
  - Structures classified as Risk Category III (previously limited only to RC IV structures), and
  - Structures in SDC E that are more than two stories above grade plane (no previous requirement based upon SDC)
- Recognizes substantial hazards that may be present in facilities considered as RC III structures, as well as those structural hazards involving multi-story structures in SDC E.

21

215

215

1705.2.6 Special Inspection—Metal Building Systems

- New special inspection requirement complement new provisions applicable to metal building systems now found in IBC Section 2214.
- Metal building systems are typically heavily dependent on bracing components to function per the design.
  - Due to a previous lack of special inspection requirements for these components, inspection of the completed installation of these critical components was often overlooked
  - While individual components are often covered by fabricator special inspections and tests, metal building systems are often unique
- Approved agency to perform inspections of erected metal building system to verify compliance with approved construction documents.

24

216

216

1705.2.6 Special Inspection—Metal Building Systems

TABLE 1705.2.6 Special Inspections Of Metal Building Systems

Type	Continuous Special Inspection	Periodic Special Inspection
1. Installation of rafter/beam flange braces and column flange braces.	—	X
2. Installation of purlins and girts, including specified lapping.	—	X
3. Purlin and girt restraint/bridging/bracing.	—	X
4. Installation of X-bracing, tightened to remove any sag.	—	X

217 24

217

1705.3 Special Inspection—Reinforcing Bar Welding

- Continuous special inspection provisions for welding of reinforcing steel in concrete construction coordinated with ACI 318.
  - Reinforcement for:
    - Special moment frames
    - Boundary elements of special structural walls
    - Coupling beams
  - Reinforcement splices
  - Primary tension reinforcement in corbels
- Inspection of "all other welds" now to be periodic rather than continuous

218 24

218

1705.5.3 Mass Timber Special Inspection – Construction

- Applicable only to Type IV-A, IV-B and IV-C construction, special inspection requirements have been added to address the anchorage and connection of mass timber structural elements.
- Inspections are similar to requirements for other prefabricated systems, such as precast concrete and structural steel.
- Additional special inspections may be required by the building official for any work unusual in its nature.

219 21

219

1705.5.3 Mass Timber Special Inspection – Construction

TABLE 1705.5.3 Required Special Inspections of Mass Timber Construction

Type	Continuous Special Inspection	Periodic Special Inspection
1. Inspection of anchorage and connections of mass timber construction to timber deep foundation systems.		X
2. Inspect erection of mass timber construction.		X
3. Inspection of connections where installation methods are required to meet design loads.		
Threaded fasteners.		
Verify use of proper installation equipment.		X
Verify use of pre-drilled holes where required.		X
Inspect screws, including diameter, length, head type, spacing, installation angle, and depth.		X
Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads.	X	
Adhesive anchors not defined in the preceding cell.		X
Bolted connections.		X
Concealed connections.		X

220 21

220

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.

221 21

221

1807.2.5 Guards on Retaining Walls

- Guards shall now be provided at retaining walls where hazardous conditions exist similar to those addressed in Section 1015.
  - Exception indicates such guards not required at retaining walls not accessible to public.
- Provisions address where required, minimum height and opening limitations as established in Section 1015.

222 24

222

1809.5.1 Frost Protection at Required Exits

- Frost protection to be provided at exterior landings of all required exits utilizing outward swinging doors.
  - Extent of protection need only extend enough to ensure the unobstructed opening of the required exit doors.
- Foundations to be protected by:
  - Extending foundation below frost line, or
  - Frost-protected shallow foundations, or
  - Erecting foundation on solid rock
- Protection helps prevent concrete landings from heaving and interfering with swing of exit door.

223 21

223

1901.2.1 Concrete with GFRP Reinforcement

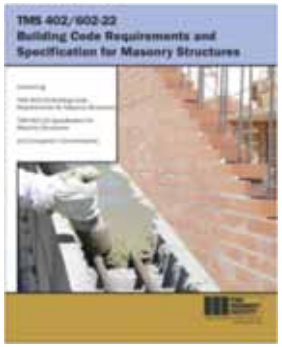
- Glass fiber-reinforced polymer (GFRP)
- ACI 440.11-22 for design
- ASTM D7957 for manufacture
- Uses include
  - Near MRI equipment
  - Highly corrosive environments
    - Bridge decks
    - Parking garages
    - Marine structures

224 24

224

2101.2 Design Methods (Masonry)

- Updated standard
- New Appendix D – GFRP Reinforced Masonry
- Removal of TMS 402 Appendix A: Empirical Design
  - Empirical design via reference to TMS 402-16
  - Needed for adobe masonry construction



225 24

225

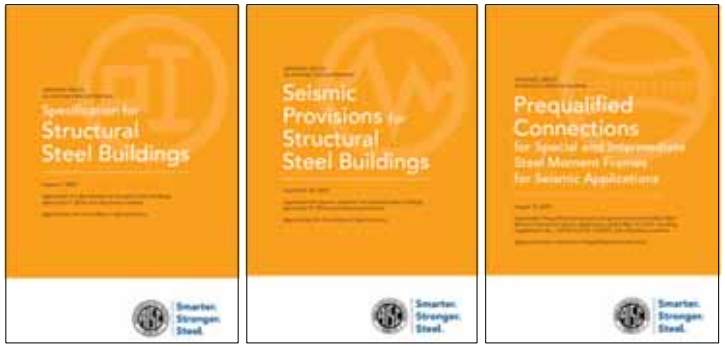
Chapter 22 Steel – Reorganization

2024 IBC Section	Summary of Section and Content Changes
2201 General	Content moved from 2201.2 Identification, 2201.3 Protection, 2201.4 Connections, and 2204.3 Anchor Rods
2202 Structural Steel and Composite Structural Steel and Concrete Structures	Renumbered from 2205 and renamed to capture composite structural steel and concrete
2203 Structural Stainless Steel	New section
2204 Cold-Formed Steel	Renumbered from 2210
2205 Cold-Formed Stainless Steel	New section
2206 Cold-Formed Steel Light-Frame Construction	Renumbered from 2211
2207 Steel Joists	No section number change
2208 Steel Deck	New section with content moved from 2210
2209 Steel Storage Racks	No section number change
2210 Metal Building Systems	New section
2211 Industrial Boltless Steel Shelving	New section
2212 Industrial Steel Work Platforms	New section
2213 Stairs, Ladders and Guarding for Steel Storage Racks and Industrial Steel Work Platforms	New section
2214 Steel Cable Structures	Renumbered from 2208

24 226

226

Chapter 22 Referenced Steel Standards – Updated



24 227

227

2210 Metal Building Systems

- New definition
- Structural steel per 2202
- CFS per 2204
- Steel joists per 2207
- Steel cable per 2214
- Special inspection per 1705.2.6

228 24

228

2306 & 2307 NDS for Wood Construction

- 2024 *National Design Specification (NDS) for Wood Construction*
  - Updated and referenced for
    - Allowable stress design (ASD)
    - Load and resistance factor design (LFRD)

Image courtesy of AWC

229 24

229

2309.1 Wood Frame Construction Manual

- Updates align with *Special Design Provisions for Wind and Seismic* (SDPWS) 2021 provisions
- Wind and snow loads consistent with ASCE 7-22

Image courtesy of AWC

230 24

230

Part 7

Building Services, Special Devices and Special Conditions

- Chapter 29 Plumbing Systems
- Chapter 30 Elevators and Conveying Systems
- Chapter 31 Special Construction

231

231

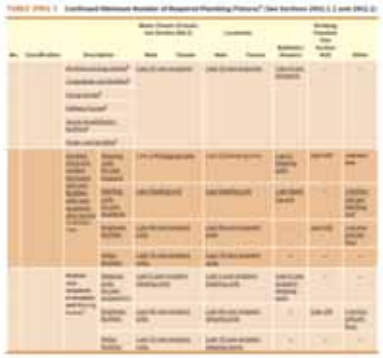
Table 2902.1 Minimum Number of Fixtures for Institutional Facilities

- Additional and more detailed information, along with reformatting, brings the Institutional portion of Table 2902.1 current with the best practices of the health-care industry.
- Previous table did not adequately distinguish between employees, customers, patients and inmates in certain types of facilities.

232 24

232

Table 2902.1 Minimum Number of Fixtures for Institutional Facilities

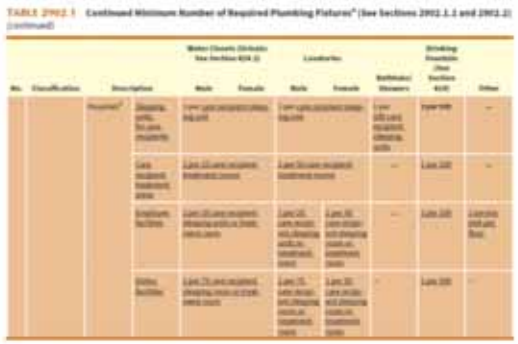


233

24

233

Table 2902.1 Minimum Number of Fixtures for Institutional Facilities



234

24

234

2902.2, #6 Separate Toilet Facilities

- Separate facilities are not required where rooms having both water closets and lavatory fixtures are designed for use by all persons regardless of sex, and
  - Water closet privacy provided per IPC Section 405.3.4
    - Separate compartment with walls or partitions and door enclosing fixtures to ensure privacy
  - Urinal privacy, where urinals provided, to be in accordance with IPC Section 405.3.5
    - Walls or partitions to provide privacy, and
      - Walls/partitions to begin at height no closer than 12 inches from floor
      - Walls/partitions to extend at least 60 inches above floor
      - Extend from wall at least 18 inches, but no less than 6 inches beyond outermost front lip of urinal

235

21

235

~~2902.2.1~~ Toilet Facility Designations

- Confusing and partially redundant provisions addressing designation of single-user and family/assisted-use toilet and bathing facilities have been deleted.
  - Section 2902.1.2 requires such toilet facilities to be identified as being available for use by all persons regardless of their sex
  - However, Section 2902.2.1 previously indicated that these facilities "shall not be required to be identified for exclusive use by either sex" (not required, but permitted)
- Deletion of Section 2902.2.1 clarifies that single-user and family/assisted-use toilet and bathing facilities required to be identified as being available for use by all persons regardless of their sex.

236

24

236

2902.3.3 Toilet Fixtures in Storage Facilities

- Location (within one story vertically) and distance (500 feet) limits imposed for travel limits to required toilet facilities may be exceeded in Group S occupancies.
  - Travel limits to be specifically approved by building official.
- Applicable to both public and employee facilities.
- Generally consistent with allowance for employee facilities in Group F occupancies.
- New allowance applicable to large warehouses, parking garages with attendants, self-storage facilities, etc.

237 21

237

2902.3.6 Door Locking of Multiple-use Toilet Facilities

- In a multi-user toilet room, the egress door is now permitted to be lockable from the interior side provided three conditions are met
- Egress door to be:
  - Lockable from inside of the toilet room only by authorized personnel by the use of a key or other approved means
  - Readily openable from the toilet room in accordance with Section 1010.2
  - Capable of being unlocked from outside the toilet room with a key or other approved means
- Allows for a safe area of refuge in the event of an emergency such as an active shooter

238 24

238

3001.2 Elevator Emergency Communication Systems

- Technical details of required elevator emergency communications system are no longer addressed in IBC as they are provided in reference standard
  - ASME—2019/CSA B44-19 *Safety Code for Elevators and Escalators*
- In addition, IBC now requires system to provide a means to enable authorized personnel to verify:
  - The presence of someone in car
  - That the person(s) is trapped
- Once an entrapment is verified, system to enable authorized personnel to:
  - Determine if assistance is needed
  - Communicate when help is on the way
  - Communicate when help arrives on site

239 21,24

239

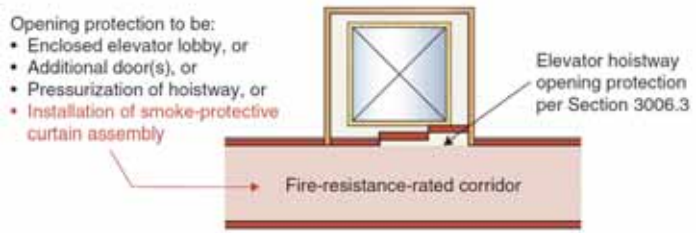
3006.3 Smoke Protective Curtain Assemblies at Elevator Hoistway Openings

- Where Section 3006.2 requires protection at an elevator hoistway door, a fifth method of protection utilizing a *smoke protective curtain assembly* has been established
- Defined as “a listed smoke and draft control curtain assembly consisting of a curtain coil, control unit, and perimeter sealing system”
- Curtain assembly to:
  - Comply with smoke and draft control requirements in Section 716.2.2.1.1 when tested per UL 1784 without an artificial bottom seal
  - Be equipped with a control unit listed to UL 864
  - Comply with Section 2.11.6.3 of ASME A17.1/CSA B44
  - Be installed and maintained in accordance with NFPA 105

240 24

240

3006.3 Smoke Protective Curtain Assemblies at Elevator Hoistway Openings



Smoke protective curtain assembly at elevator hoistway opening.

241 24

241

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, previously only defined in the 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.

242 21

242

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

243 21

243

3103 Temporary Structures

- New definitions, reduced environmental loads, installation inspections and maintenance inspections now included for temporary structures.
- Multiple new and modified requirements for “public-occupancy temporary structures.”
  - *Any building or structure erected for a period of one year or less that serves an assembly occupancy or other public use.*

244 24

244

3103 Public-Occupancy Temporary Structures—Structural Loads

- Public-occupancy assembly structures are specifically regulated for:
  - Assumption of 10-year service life, with allowance for extensions for up to one-year by building official where multiple conditions are met.
  - Permissible reduction in environmental design live loads as specified where demonstrated compliant by registered design professional.
  - Installation and maintenance inspections by qualified persons
    - Components when acquired and at least once a year.
    - At regular intervals when in service to ensure performance as intended.
  - Controlled occupancy procedures to address vacation of structures during environmental event.

245 24

245

3103.6.1 Public-Occupancy Temporary Structures—Structural Loads

- Public-occupancy temporary structures to be designed per Chapter 16, except as modified, and include snow, wind, seismic, ice and tsunami loads, as well as temporary foundations.

246 24

246

3111.3.5 Elevated PV Support Structures

- Overhead photovoltaic support structures now regulated where potential exists for people or vehicles in space beneath them.
  - Not applicable where installed over agricultural use
- Where installed over open-grid framing or noncombustible deck:
  - Panels to be tested, listed and labeled with fire type rating per UL 1703, or per UL 61730 1&2.
  - Panels marked “not fire rated” not to be installed on elevated PV support structures.
- Where installed over roof assembly, panel system to have fire classification in accordance with Section 1305.9

247 24

247

3114 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

248 21

248

3114 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.

249 21

249

3114 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.

250 21

250

Part 8

Appendices

- Appendix B Board of Appeals
- Appendix P Sleeping Lofts

251

251

Appendix B Board of Appeals

- New and expanded criteria for board of appeals as established in Section 113, including detailed provisions dealing with:
  - Application process
  - Board membership
  - Board meetings
- Number of voting members established at five, with no specific period of service identified.
- Three members constitute a quorum
- Occupation/professional registration criteria deleted
- As with all appendix chapters, only applicable where specifically adopted by jurisdiction.

252 21

252

Appendix P Sleeping Lofts

- New Appendix P sets forth scoping limitations and technical criteria for sleeping lofts within Group R dwelling units and sleeping units
- Provisions based largely on IRC Appendix RQ regulating tiny houses
- The following lofts are exempt from compliance with App. P
  - Maximum depth of < 3 feet, or
  - Floor area < 35 square feet, or
  - Not provided with a permanent means of egress
- Scoping limitations include:
  - Floor area < 70 square feet, and
  - Ceiling height ≤ 7 feet for more than ½ of loft floor area

253 24

253

Appendix P Sleeping Lofts

- Special technical requirements/allowances include:
  - Means of egress
  - Guards
  - Smoke alarms
- Where permanent means of egress provided for sleeping lofts, the egress to comply with Chapter 10, except as modified in the following areas:
  - Stairway width, treads, risers and landings
  - Alternate tread devices height limit
  - Ship's ladder's height limit
  - Ladder's height limit, size, capacity and incline

254 24

254

Thank you for Attending

Discussion

- Visit learn.iccsafe.org for more training opportunities

255

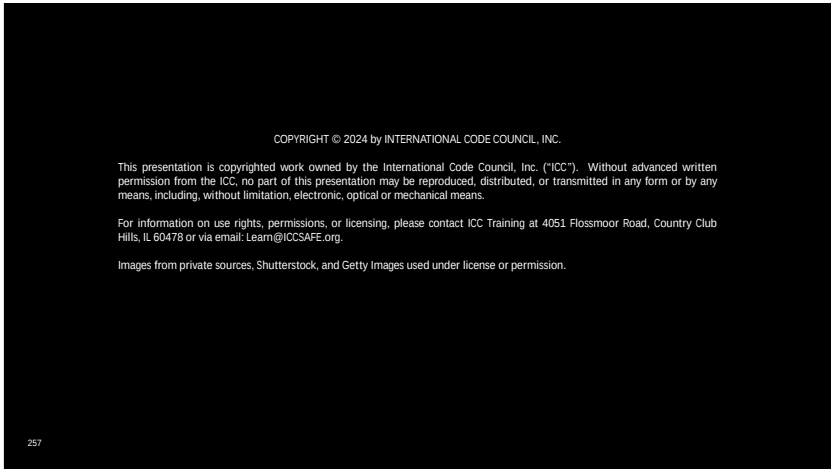
255

International Code Council is a Registered Provider with The American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of Completion for non-AIA members are available on request.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

256

256


COPYRIGHT © 2024 by INTERNATIONAL CODE COUNCIL, INC.
This presentation is copyrighted work owned by the International Code Council, Inc. ("ICC"). Without advanced written permission from the ICC, no part of this presentation may be reproduced, distributed, or transmitted in any form or by any means, including, without limitation, electronic, optical or mechanical means.
For information on use rights, permissions, or licensing, please contact ICC Training at 4051 Flossmoor Road, Country Club Hills, IL 60478 or via email: Learn@ICCSAFE.org.
Images from private sources, Shutterstock, and Getty Images used under license or permission.
257

257


ICC
INTERNATIONAL CODE COUNCIL
International Code Council, Inc.
Training Department
888-ICC-SAFE, Ext 33821
Learn@ICCSAFE.org
Building Professional Careers!
258

258