Significant Changes from the 2012 IBC to 2018 IBC in Southern Nevada

Presented by: Southern Nevada ICC Chapter

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Learning Objectives

- A brief overview of significant base code changes between the 2012 IBC and the 2018 IBC.
- A review of notable Southern Nevada amendments under the 2018 IBC.
- A review of the unique high-rise/ mid-rise building design requirements in each local Southern Nevada Authority Having Jurisdiction (AHJ).
- A review of the “rules of the road” when applying the 2018 IEBC.

Speaker Biographies - 2018 IBC Group

Michael Gentille, C.B.O.

- PCNA Group Consulting Engineers, Inc. – Founder & President
- 2018 SNICC - IBC General Committee Chairman
- Southern Nevada ICC Chapter – Previous Board Member
- ICC Certified Building Official

Jim Gerren, P.E., C.B.O.

- Assistant Director – Clark County Department of Building & Fire Prevention
- Southern Nevada ICC Chapter – President
- 2012 SNICC – IBC General Committee Chairman
- Registered Fire Protection Engineer & ICC Certified Building Official

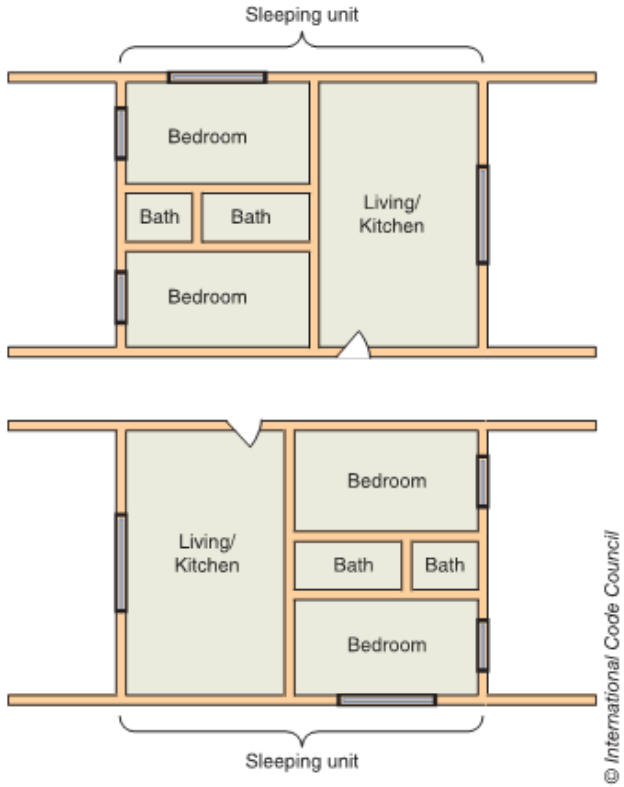
Recent 2018 IBC / IEBC Code Adoptions

- In 2012, all local AHJ's adopt same IBC amendment package
- In 2018, high-rise building definitions diverge among the local AHJ's
- In 2012, only City of Las Vegas adopted the IEBC code
- In 2018, all local AHJ's adopt the IEBC

Code Cycle	IBC	IEBC
2012	All Local AHJ's Adopt the Same Amendments	Only Adopted by City of Las Vegas
2018	All Local AHJ's Adopt the Same Amendments with a Few Significant Exceptions	All Local AHJ's Adopt the Same Amendments

Chapter 2
Sleeping Unit Clarifications

Sleeping Unit: ***A single unit that provides rooms or spaces for one or more persons, includes permanent provisions for sleeping and can include provisions for living, eating and either sanitation or kitchen facilities but not both.***



KEY CONCEPTS:

- The provisions in Chapter 7 that require sleeping units to be separated from adjacent groups and the corridor, but does not require the bedrooms within a given sleeping unit to be separated from the associated living room or bathrooms within that same unit.

- Clarification also provided that only the main corridors have fire alarms, and smoke alarms can be within the unit. Previously, it was unclear if the living and sanitation were considered part of the unit or an extension of the main corridor.

Chapter 3
Occupancy Classifications

Group B: Food processing establishment and commercial kitchens NOT associated with restaurants, cafeterias and similar dining facilities LESS than 2,500 SF in area.

Group F: Food processing establishment and commercial kitchens NOT associated with restaurants, cafeterias and similar dining facilities GREATER than 2,500 SF in area.

Group A-2: Commercial kitchens THAT ARE associated with restaurants, cafeterias and similar dining facilities, regardless of area.

Chapter 3 - Section 311.1.1

Accessory Storage Spaces

A room or space for storage purposes (regardless of room size) that is accessory to another occupancy shall be classified as part of that occupancy.

- The occupant load factor of 1:300 for storage may still be applied
- References to allowable area and percent of area are no longer applicable

Chapter 4 - Section 403
High-Rise Buildings

Under 2012 IBC, all local AHJ's defined a "high-rise building" as a building having an occupied floor more than 55 feet above the lowest level of fire department vehicle access.

However, under 2018 IBC adoption, the rules vary among each local AHJ as follows:

- City of Henderson adopted the base code provision of 75 feet (*without exception*)
- City of Las Vegas adopted the 75 feet provision, but also adopted "IBC Section 429" which applies "mid-rise building" rules for buildings between 55 feet to 75 feet
- Clark County, City of North Las Vegas, State of Nevada and Clark County School District all maintain the 55 feet carry-over provisions from 2012 IBC (*without exception*)

Chapter 4 - Section 404
Atriums

An EXCEPTION is added to this section (in the base code) to omit the fire barrier requirement:

- ***EXCEPTION:*** *A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.*

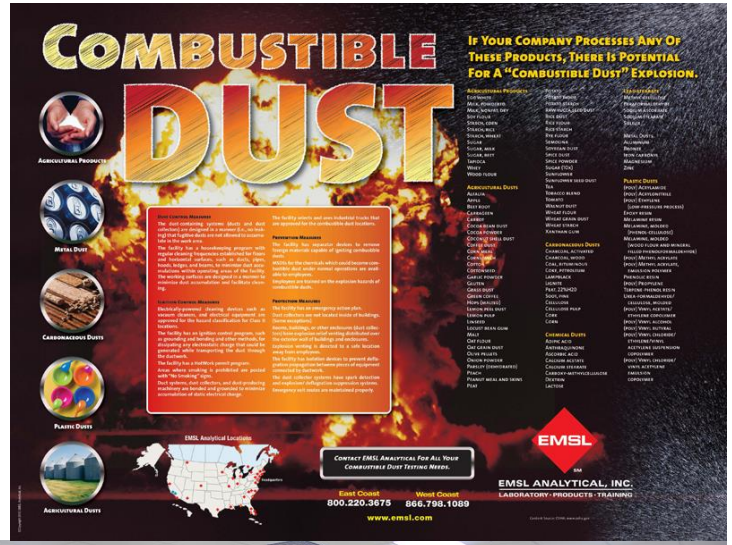
- **KEY EXAMPLE:** Smoke control systems are not required for 2-story atriums, in other than Group I-2 and I-1 (condition 2) occupancies.

- **NOTE:** Per IBC 404.9.3, where egress is not at level of exit discharge, travel distance through atrium shall not exceed 200 feet.

NOTE: Per IBC 404.10, up to 50% of interior exit stairways are permitted to egress through an atrium at the level of exit discharge.

Chapter 4 – Newly Added Sections

- Section 426 – Combustible Dusts, Grain Processing/Storage
- Section 427 – Medical Gas Systems
- Section 428 – Higher Education Laboratories

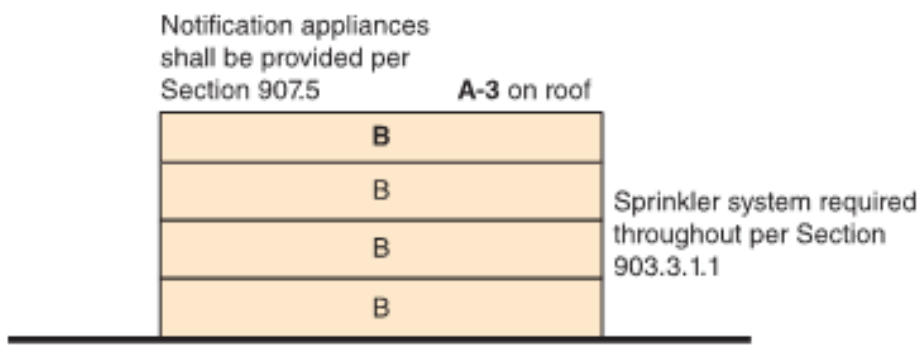


Chapter 5 - Section 503.1.4
Occupied Roofs

A roof level or portion thereof is permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof.

- **Exception:** The roof occupancy shall not be limited to the occupancies allowed on the story below when the building is fully sprinklered and fire alarm occupant notification is provided on the occupied roof
- **Note:** Occupied roof is NOT a story. As such, it's area is <u>not</u> included in the overall building area calculation
- **Note:** There are also additional restrictions on enclosures

Example:
If building of Type VA construction,
Group B: 4 stories max. (S)
Group A-3: 3 stories max. (S)



Occupied roof example

Chapter 5 - Section 504.4
Number of Stories

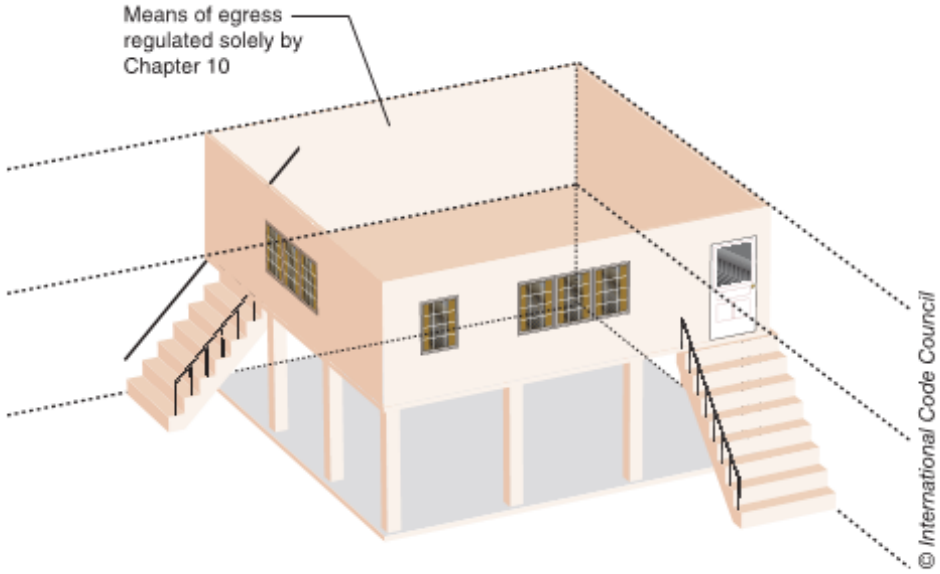
An EXCEPTION is added to this section (via local amendment) to allow one (1) additional story for certain buildings:

- ***EXCEPTION:*** *In occupancies other than Groups E, F, H and I, where a building of Type II, III-A, or VA construction is equipped throughout with an approved automatic sprinkler system and complies with the high-rise provisions of Section 403, the maximum number of stories may be increased by one (1).*

- **KEY EXAMPLE:** Under this section, a 4-story Group R-2 building of Type V-A construction may be increased to 5-stories if the features noted above are provided.

Chapter 5 - Section 505.2.3
Mezzanines

Direct access to at least one exit at mezzanine level is no longer required for enclosed mezzanines.



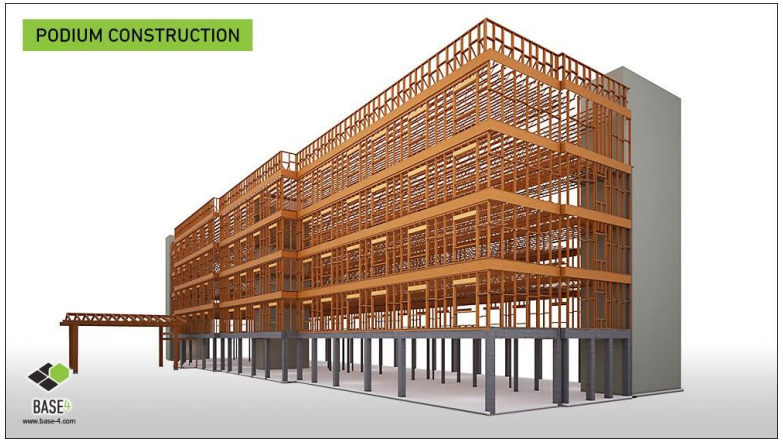
Enclosed mezzanine with two means of egress

This change is considered to be an acceptable reduction in required means of egress.

Chapter 5 - Section 510.2

Horizontal Building Separation Allowance

This provision essentially allows a building of a given construction type to be constructed above a Type I-A building, while considering each to be two (2) separate and distinct buildings where a 3-hour horizontal assembly divides them.



- 2012 IBC: Type I-A building is limited to 1-story above grade
- 2018 IBC: Number of stories in Type I-A building not limited

- KEY PREMISE: This change was allowed since the maximum overall building height (in feet) is the determining factor here, not the actual number of stories within the building.

Chapter 5 – 2012 Table 503

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

GROUP		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
		STORIES(S) AREA (A)								
A-1	S	UL	5	3	2	3	2	3	2	1
	A	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
A-2	S	UL	11	3	2	3	2	3	2	1
	A	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
A-3	S	UL	11	3	2	3	2	3	2	1
	A	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
A-4	S	UL	11	3	2	3	2	3	2	1
	A	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
A-5	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
	A	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	S	UL	11	5	3	5	3	5	3	2
	A	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
E	S	UL	5	3	2	3	2	3	1	1
	A	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9,500

Chapter 5 – 2018 Table 504.3

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

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
H-1, H-2, H-3, H-5	NS[c, d]	UL	160	65	55	65	55	65	50	40
	S									
H-4	NS[c, d]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 1, I-3	NS[d, e]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 2, I-2	NS[d, e, f]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85						

Chapter 5 – 2018 Table 504.4

TABLE 504.4
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	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
	NS	UL	11	4	2	3	2	4	2	1

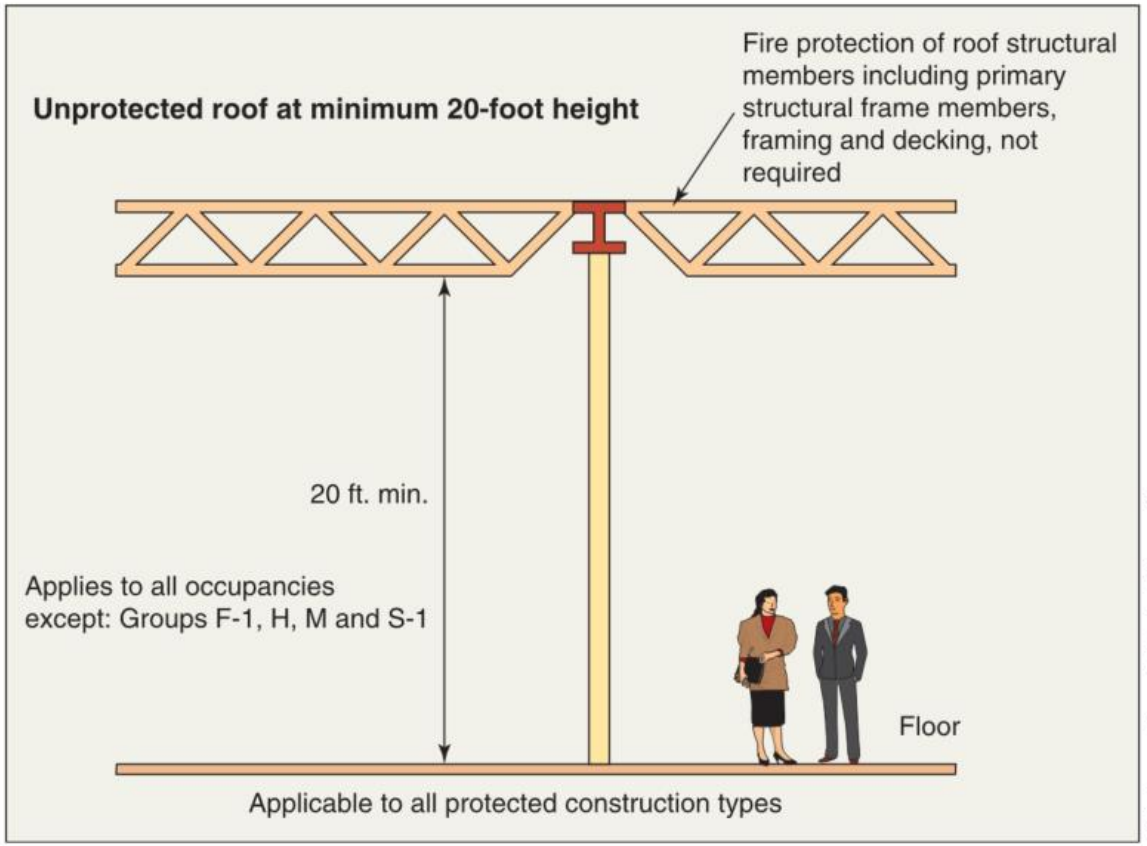
Chapter 5 – 2018 Table 506.2

TABLE 506.2
ALLOWABLE AREA FACTOR (A_t = 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	HT	A	B
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
	S1	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	SM	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500
A-2	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-4	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
	NS									

Chapter 6 – Table 601
Footnote b.

Except in Group F-1, H, M and S-1 occupancies, all portions of the roof construction, **including primary structural frame members** are now exempt from fire-resistive requirements where every portion of the roof construction is at least 20 feet above any floor immediately below.



Chapter 7 – Section 705.3
Buildings on the same lot

An EXCEPTION is added to this section (via local amendment) to allow multiple lots in a commercial subdivision to be considered a single lot if certain conditions are met:

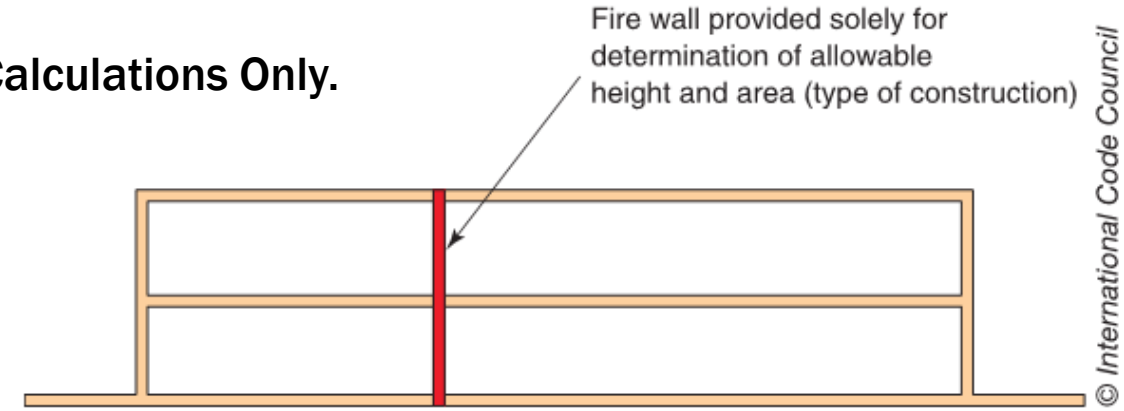
- ***EXCEPTION:*** *At the discretion of the Building Official, multiple lots within a commercial subdivision established in accordance with NRS, may be considered a single lot where approved reciprocal agreements are in place to maintain the building and associated building service equipment.*

- **KEY CONCEPT:** This provision was added to address vacated big-box stores in strip malls to allow them to share utilities and limit demising wall separation requirements.

Chapter 7 – Section 706.2
Fire Wall Structural Stability

Modifications were made to this section to clarify structural integrity requirements for a Fire Wall.

- **REQUIREMENT:** Designed and constructed to allow collapse of the structure on either side without collapse of the fire wall under fire conditions.
- **KEY CONCEPT:** Building Height & Area Calculations Only.
- **NOTE:** Double Fire Walls in accordance with NFPA 221 are still permitted.



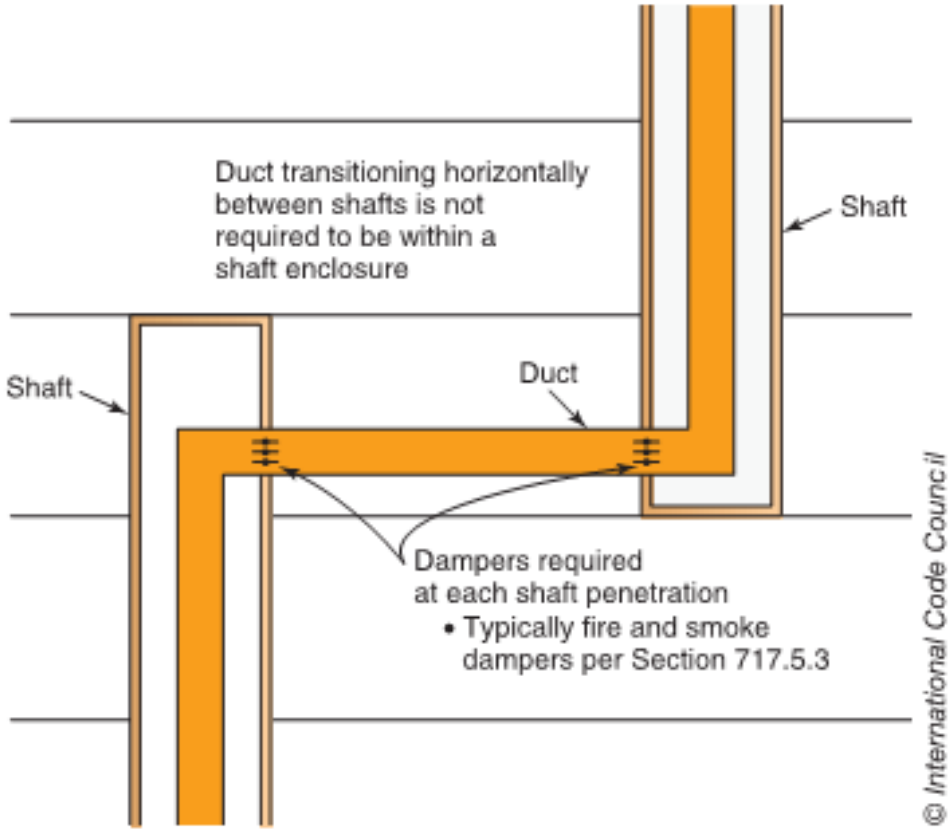
Use of fire wall

Chapter 7 – Section 717.1.1

Ducts and air transfer openings

Ducts transitioning horizontally between shafts shall not require a shaft enclosure

However, where ducts penetrate each shaft, a damper must be provided



Duct transitioning between shafts

Chapter 9 – Section 902.2
Fire Riser Rooms

A new section is added (via local amendment) to require a dedicated sprinkler riser room for each sprinkler system. However, several exceptions to this requirement may be applied.

EXCEPTIONS:

- Wall-mounted PIV and exterior access provided to a monitoring panel in a conditioned room (where approved by the Fire Official)
- Where a single system serves the building and is controlled by a PIV
- In multi-story buildings, floor control risers are permitted on each floor level in an exit stair enclosure

KEY REQUIREMENTS:

- Riser room must be 16 SF minimum, with a minimum dimension of 4 feet for the 1st riser and 9 SF for each additional riser in the room
- Must be accessible from the building exterior and maintained between 40 F and 100 F

Chapter 10
Means of Egress

Significant changes and reorganization to the entire chapter have occurred. Several previously separate requirements now moved into a single code section (Section 1006).

KEY CHANGES:

- Table 1004.5 – Occupant load factor for Business went from 100 gross to 150 gross.
- Table 1004.8 – Concentrated Business Use Areas added to address call centers, trading floors, etc. These may be calculated at actual occupant load (if approved by Building Official), but not less than 1:50 OLF.
- Section 1006.3 – Clarification that when stairways serve more than one story or occupied roof, only the occupant load on that story or occupied roof are used to calculate the required number and minimum size of exits.
- Local amendment to Table 1006.2.1 allows Group R-1 spaces with one exit a maximum of 20 occupants (base code = 10 occs.) and maximum common path of travel 125 feet (base code = 75 feet) in sprinklered buildings.
- Section 1006.2.1 – The limiting factor of stories with one exit or exit access doorway changed from “travel distance” to “common path of egress travel”. Example: occupants of a 2nd story space can use unenclosed stairs as the only means of egress, provided that the common path of travel complies with Section 1006.2.1.

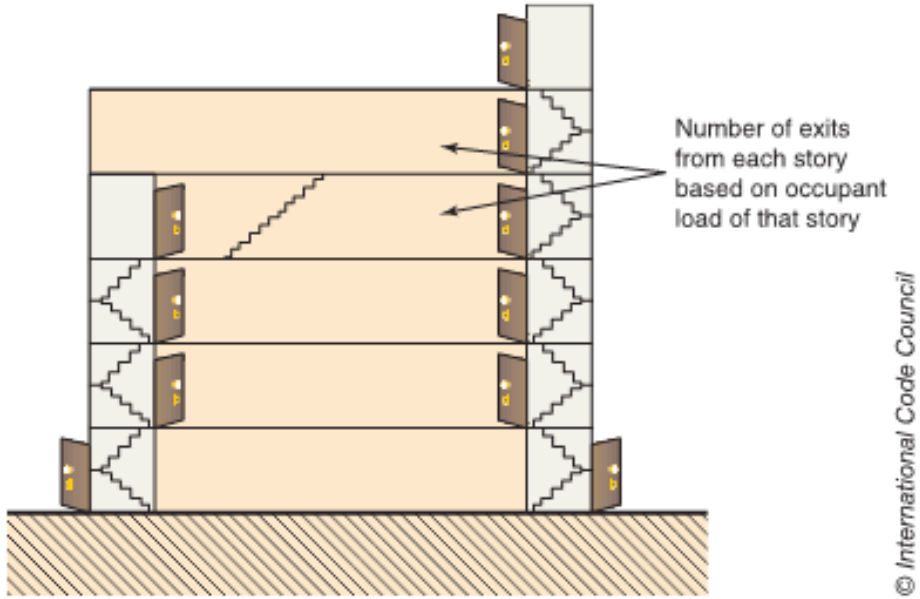
Chapter 10
Means of Egress

KEY CHANGES (continued):

Path of egress travel to an exit shall not pass through more than one (1) adjacent story.

EXCEPTIONS:

- Residential occupancies
- Open parking garages
- Open-air assembly seating and exit access stairways serving balconies / galleries / press boxes (theaters, auditoriums, sports venues)



Egress travel in multi-story building

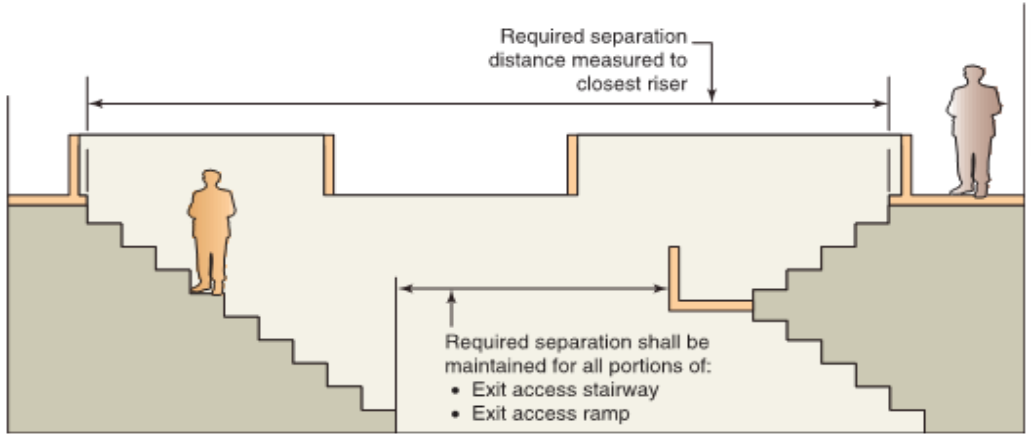
Chapter 10
Means of Egress

KEY CHANGES (continued):

Section 1007.1 better clarifies how to measure distance between; exit access doorways, stairs & ramps.

KEY REQUIREMENTS:

- Separation distance to be measured to any point along the width of the doorway
- Separation distances to be maintained for entire length of travel on stair or ramp to prevent convergence

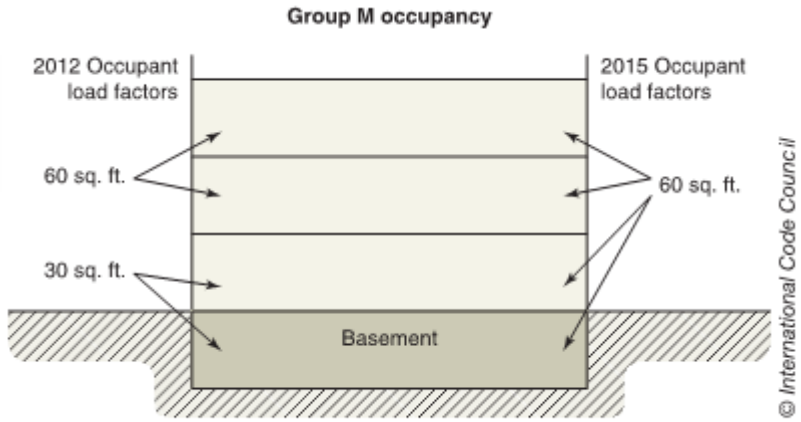


Chapter 10 – Section 1004.1.2
Merchantile Occupant Load Factors

This section has been revised to be 1:60 OLF regardless of the story on which the merchantile occupancy occurs.

KEY CHANGES:

- In 2012 IBC, there were two different OLFs for merchantile occupancies
- This change reflects the trend from multi-story single operator buildings to larger floor areas within a single story



Occupant load factor—mercantile

Chapter 10 – Section 1009.8 Two-Way Communication Systems @ Elevator LANDINGS

This section has been revised to provide EXCEPTIONS to two-way communication system requirements at elevator landings.

EXCEPTIONS:

- Where two way communication systems are provided in area of refuge
- Floors where ramps are provided
- Service elevators that are not designated as AME's or accessible routes
- Freight elevators
- Private residence elevators

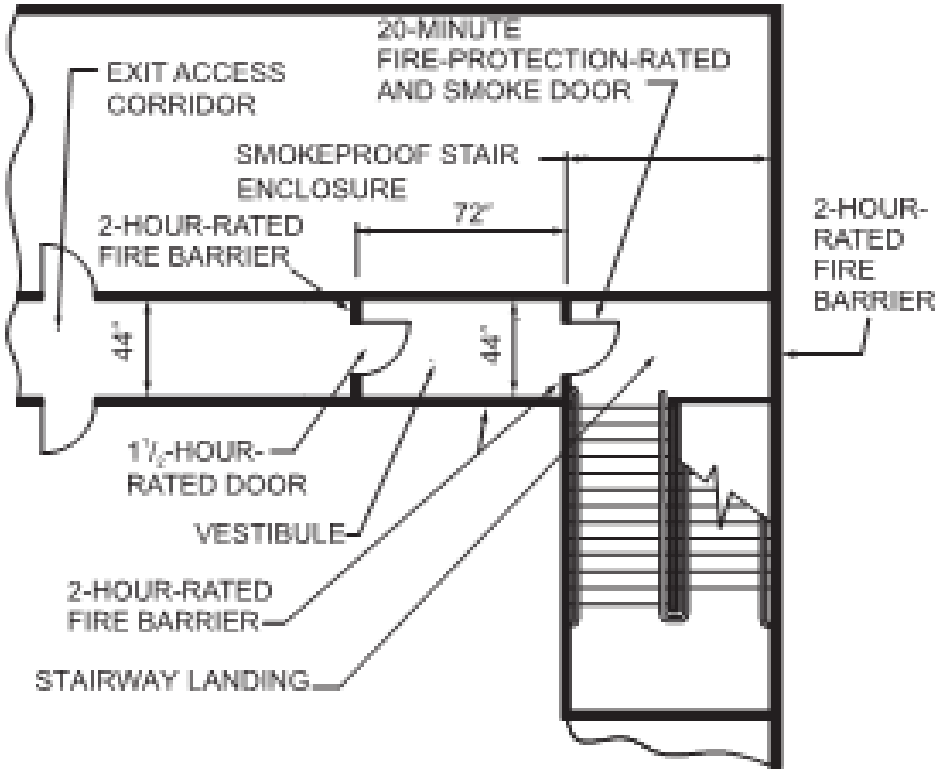
A two-way communication system may serve multiple elevators

Chapter 10 – Section 1010.8
Door Arrangement

This section is modified (via local amendment) to clarify the minimum dimensions for vestibules serving smokeproof enclosures at pressurized stairways.

KEY REQUIREMENTS:

Vestibules shall not have a width of less than 44 inches and shall not have a length of less than 72 inches in the direction of egress travel



Chapter 10 – Section 1013.2
Floor Level Exit Signs in Group R-1 Occupancies

This section is modified to provide a greater range of floor level exit signage placements.

KEY REQUIREMENTS:

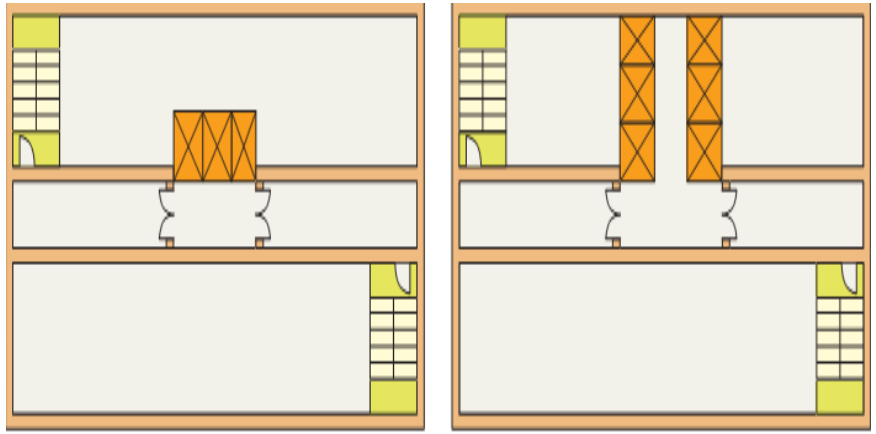
- 2012 IBC limited this range from 10 - 12 inches A.F.F.
- 2018 IBC increases this range from 10 - 18 inches A.F.F.

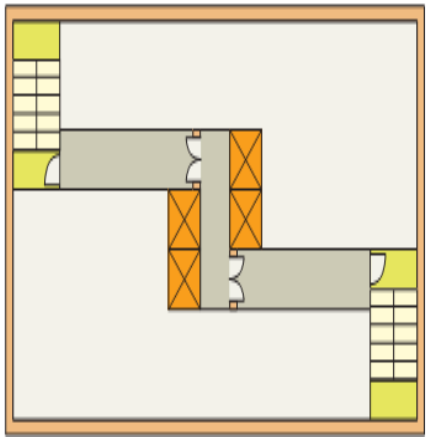
Low-level exit sign

Chapter 10 – Section 1016.2

Egress through Intervening Spaces

This section is modified to allow egress through an elevator lobby.





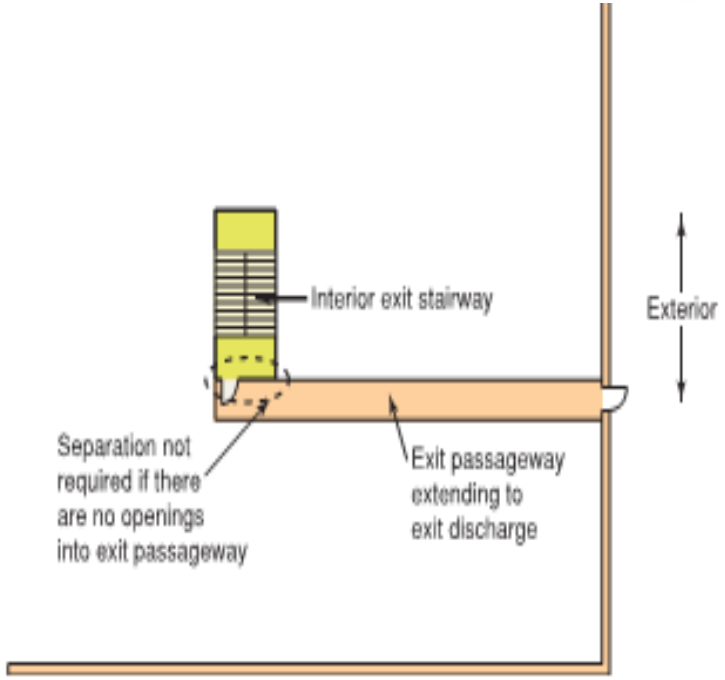
KEY REQUIREMENTS:

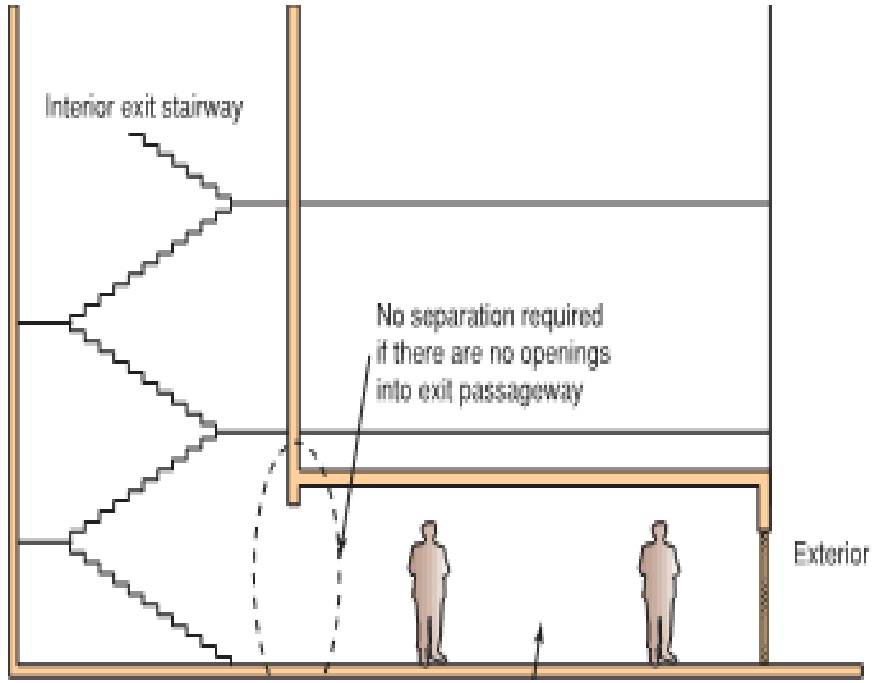
- Access to at least one (1) exit must be provided without travel through the lobby
- Protection required for the lobby is not required to extend to exit unless required by other sections of the code (e.g. fire service access elevator lobby)
- Similar continuity rules as applicable to foyers and lobbies

Chapter 10 – Section 1023.3.1
Egress through Intervening Spaces

KEY REQUIREMENT:

- **An interior exit stairway is now permitted to continue directly into an exit passageway without a required fire-door assembly to separate the two elements, provided there are no openings into the exit passageway or the exit enclosure is pressurized.**





Chapter 10 – Section 1023.5 & 1024.6

Interior Exit Stairway and Exit Passageway Penetrations

This section is modified to better clarify systems that may penetrate interior exit stairways and exit passageways.

KEY REQUIREMENTS:

- Fire Protection Systems
- Security Systems
- Two-way Communication Systems

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Stair enclosure penetrations

Chapter 11 – Section 1109.16

Electric Vehicle Charging Stations

Requirements added via local amendments to standardize the design parameters for electric vehicle charging stations (EVCS).

KEY REQUIREMENTS:

- EVCS are never required. However, when provided they must comply with this section.
- EVCS are not treated as parking spaces, rather they are a “feature” on the site.
- Conversely, there is nothing to preclude one from including EVCS within the parking counts on a site.
- The first EVCS requires an adjacent 8 foot wide accessible aisle adjacent to it. This is NOT designated as “accessible”, but allows all users (including the disabled) to utilize this EVCS. In other words, it is “adaptable”, not “accessible”.
- A requirement for a dedicated “accessible” EVCS is not triggered until more than 10 charging stations are provided within the same site (parcel). This EVCS would require an “ADA” sign to limit access to the disabled only.

Chapter 12 – Section 1210
Baby Changing Tables

Requirements added via local amendments to address Nevada State Law that requires the installation of a Baby Changing Table (BCT) in all newly constructed buildings.

KEY REQUIREMENTS:

- Minimum of one (1) BCT required in ALL occupancies except where age-restricted license is issued (i.e. casino, tavern, etc.)
- Two (2) BCT's required if not available to both male & female occupants
- BCT generally located in public restroom(s), but can be elsewhere if permission granted by Building Official
- BCT must be designed to comply with accessibility requirements per A117.1 (ex: mounting height, front approach, clearances, etc.)

Chapter 29 – Table 2902.1
Required Plumbing Fixtures

This table was modified to remove the Occupancy Group column entirely.

KEY CONCEPT:

- **Plumbing fixture requirements are based entirely on use/classification, rather than the occupancy group they occur within.**
- **This change more closely tracks with Table 1004.3 for determination of occupant load factors.**

[P] TABLE 2902.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 2902.1.1 and 2902.2)

No.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 424.2 OF THE *INTERNATIONAL PLUMBING CODE*)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS (SEE SECTION 410 OF THE *INTERNATIONAL PLUMBING CODE*)	OTHER
			Male	Female	Male	Female			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
			1 per 100 for	1 per 50 for					

Chapter 30 – Section 3001.2

Emergency Elevator Communication Systems for the Deaf, Hard of Hearing, and Speech Impaired

This section is <u>new</u> in the 2018 IBC.

KEY REQUIREMENTS:

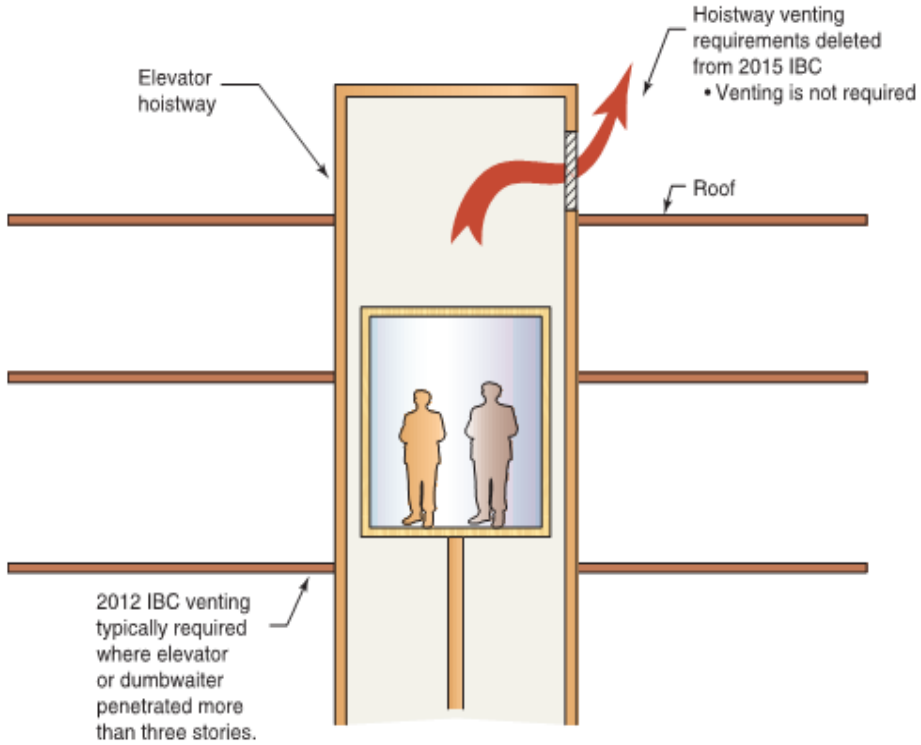
- Emergency two-way communication system that is required <u>inside</u> elevator car
- Requires <u>BOTH</u> Visual & Text-Based with live 24/7 connection to remote party
- Fully accessible by the deaf, hard of hearing, and speech impaired
- Must include voice-only options for hearing individuals
- Must be able to communicate with emergency personnel using existing video conferencing technology, chat/text software, or other approved technology

Chapter 30 – Section 3004
Elevator Hoistway Venting

This section is removed entirely from the 2018 IBC.

KEY CHANGES:

- Elevator hoistways are no longer required to be vented to the exterior
- Installation of plumbing and mechanical systems in the hoistway is still prohibited
- Requirement for hoistway venting also removed from ANSI A17.1 Elevator Code
- These requirements were eliminated due to lack of demonstrated need

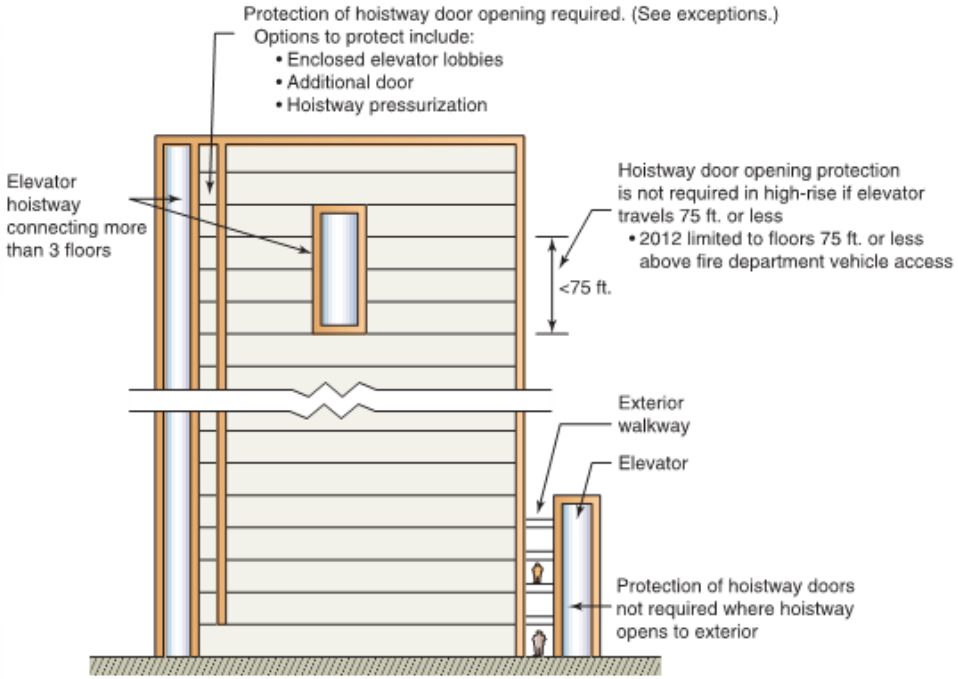


Chapter 30 – Section 3006
Elevator Lobbies

This section is relocated from 713.14.1 (in 2012 IBC) to 3006 (in 2018 IBC).

KEY REQUIREMENTS:

- Door opening protection only required where elevation in hoistway exceeds 75 feet (exception for Group I or non-sprinklered buildings)
- Lobby or door opening protection is not required where hoistway opens to the exterior and/or on the level of exit discharge
- Opening protection is still required where hoistway opens onto rated corridor



Thank You !!!!

This concludes today's presentation on the 2018 International Building Code (IBC).

On behalf of your Southern Nevada ICC Chapter, we would like to thank you for your participation.

Please visit: www.snicc.org to download PDF-format version of this presentation.