CONST-181
Building Code Interpretation: Non-Structural

Q9

Question 1

A court or yard that provides access to a public way for one or more exits is considered a(n) _____

- ○ exit access way
- ○ egress court
- ○ public way
- ○ horizontal exit

Question 2

Which of the following elements is not a distinct and separate part of the means of egress?

- ○ exit discharge
- ○ exit access
- ○ exit
- ○ exit convergence

Source: archicorner

Q9

Question 1

A court or yard that provides access to a public way for one or more exits is considered a(n) _____

- exit access way
- egress court
- public way
- horizontal exit

[BE] EGRESS COURT. A *court* or *yard* which provides access to a *public way* for one or more *exits*.

Question 2

Which of the following elements is not a distinct and separate part of the means of egress?

- exit discharge
- exit access
- exit
- exit convergence

Source: archicorner

Q9

Question 3 0.15 pts

That portion of exit access travel distance measured from the most remote point of each room, area or space to that point where the occupants have separate and distinct access to two exits or exit access doorways is considered a _____.

- ○ means of egress
- ○ single egress path
- ○ common path of egress travel
- ○ limited egress travel distance

Question 4 0.15 pts

Panic hardware that is listed for use on fire door assemblies is considered to be _____ hardware.

- ○ fire egress
- ○ fire exit
- ○ panic
- ○ panic and fire

Source: archicorner

Q9

Question 3 0.15 pts

That portion of exit access travel distance measured from the most remote point of each room, area or space to that point where the occupants have separate and distinct access to two exits or exit access doorways is considered a _____.

- ○ means of egress
- ○ single egress path
- ● common path of egress travel
- ○ limited egress travel distance

[BE] COMMON PATH OF EGRESS TRAVEL. That portion of *exit access* travel distance measured from the most remote point of each room, area or space to that point where the occupants have separate and distinct access to two *exits* or *exit access* doorways.

Question 4 0.15 pts

Panic hardware that is listed for use on fire door assemblies is considered to be _____ hardware.

- ○ fire egress
- ● fire exit
- ○ panic
- ○ panic and fire

[BF] FIRE EXIT HARDWARE. *Panic hardware* that is *listed* for use on *fire door assemblies*.

Source: archicorner

Q9

Question 5 0.1

In determining the design occupant load for the sales area of a mercantile facility, the floor area shall be divided by a factor of one occupant per _____ squa feet.

- ○ 20
- ○ 30
- ○ 50
- ○ 60

Question 6 0.1

For areas having fixed seats and aisles, the occupant load for bench seating without dividing arms is based on one occupant for each _____ inches of seating length.

- ○ 15
- ○ 18
- ○ 24
- ○ 30

Source: archicorner

Q9

Question 5 0.1

In determining the design occupant load for the sales area of a mercantile facility, the floor area shall be divided by a factor of one occupant per _____ squa feet.

- ○ 20
- ○ 30
- ○ 50
- ● 60

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Accessory storage areas, mechanical equipment room	300 gross
Mercantile	60 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross

Question 6 0.1

For areas having fixed seats and aisles, the occupant load for bench seating without dividing arms is based on one occupant for each _____ inches of seating length.

- ○ 15
- ● 18
- ○ 24
- ○ 30

1004.6 Fixed seating. For areas having *fixed seats* and *aisles*, the *occupant load* shall be determined by the number of *fixed seats* installed therein. The *occupant load* for areas in which *fixed seating* is not installed, such as waiting spaces, shall be determined in accordance with Section 1004.5 and added to the number of *fixed seats*.

For areas having *fixed seating* without dividing arms, the *occupant load* shall be not less than the number of seats based on one person for each 18 inches (457 mm) of seating length.

Source: archicorner

Q9

Question 7

A stairway serving 160 occupants in a fully-sprinklered Group I-2 hospital shall be a minimum of _____ inches in width.

- ○ 42
- ○ 44
- ○ 48
- ○ 60

Question 8

Emergency lighting facilities for means of egress illumination shall initially provide_____ along the path of egress at floor level.

- ○ at least 1 foot-candle
- ○ average of 1 foot-candle
- ○ at least 5 foot-candles
- ○ an average of 0.2 foot-candle

Source: archicorner

Q9

Question 7

A stairway serving 160 occupants in a fully-sprinklered Group I-2 hospital shall be a minimum of _____ inches in width.

- ○ 42
- ○ 44
- ● 48
- ○ 60

1009.3.2 Stairway width. *Stairways* shall have a clear width of 48 inches (1219 mm) minimum between *handrails*.

Exceptions:

1. The clear width of 48 inches (1219 mm) between *handrails* is not required in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between *handrails* is not required for *stairways* accessed from a refuge area in conjunction with a *horizontal exit*.

Question 8

Emergency lighting facilities for means of egress illumination shall initially provide_____ along the path of egress at floor level.

- ○ at least 1 foot-candle
- ● average of 1 foot-candle
- ○ at least 5 foot-candles
- ○ an average of 0.2 foot-candle

1008.3.5 Illumination level under emergency power. Emergency lighting facilities shall be arranged to provide initial illumination that is not less than an average of 1 footcandle (11 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded. In Group I-2 occupancies, failure of a single lamp in a luminaire shall not reduce the illumination level to less than 0.2 footcandle (2.2 lux).

Source: archicorner

Q9

Question 9 0.15 pts

In a nonsprinklered building, a stairway utilized as an accessible means of egress shall be a minimum of _____ inches in clear width between handrails.

- ○ 36
- ○ 44
- ○ 48
- ○ 60

Question 10 0.15 pts

Multiple means of egress shall be sized so that the loss of any one means of egress shall not reduce the available capacity to less than _____ of the required capacity.

- ○ 10 %
- ○ 25 %
- ○ 33.33 %
- ○ 50%

Source: archicorner

Q9

Question 9

0.15 pts

In a nonsprinklered building, a stairway utilized as an accessible means of egress shall be a minimum of _____ inches in clear width between handrails.

- ○ 36
- ○ 44
- ● 48
- ○ 60

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0.15 pts

Multiple means of egress shall be sized so that the loss of any one means of egress shall not reduce the available capacity to less than _____ of the required capacity.

- ○ 10 %
- ○ 25 %
- ○ 33.33 %
- ● 50%

1005.5 Distribution of minimum width and required capacity. Where more than one *exit*, or access to more than one *exit*, is required, the *means of egress* shall be configured such that the loss of any one *exit*, or access to one *exit*, shall not reduce the available capacity or width to less than 50 percent of the required capacity or width.

Source: archicorner

Q10

Question 1 0.15 pt

In general, a door opening shall provide a minimum clear width of _____ inches.

- ○ 30
- ○ 32
- ○ 34
- ○ 36

Question 2 0.15 pt

In other than a Group H occupancy, egress doors shall swing in the direction of egress travel where serving a minimum occupant load of _____ persons.

- ○ 10
- ○ 30
- ○ 50
- ○ 100

Source: archicorner

Q10

Question 1 0.15 pt

In general, a door opening shall provide a minimum clear width of _____ inches.

- ○ 30
- ● 32
- ○ 34
- ○ 36

1010.1.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2, doors serving as means of egress doors where used for the movement of beds shall provide a minimum clear opening width of $41^{1}/_{2}$ inches (1054 mm). The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Question 2 0.15 pt

In other than a Group H occupancy, egress doors shall swing in the direction of egress travel where serving a minimum occupant load of _____ persons.

- ○ 10
- ○ 30
- ● 50
- ○ 100

1010.1.2.1 Direction of swing. Side-hinged swinging doors, pivoted doors and balanced doors shall swing in the direction of egress travel where serving a room or area containing an *occupant* load of 50 or more persons or a Group H occupancy.

Source: archicorner

Q10

Question 3

A fire-rated egress door shall move to a full-open position when subjected to a maximum _____ force.

- ○ 5-pound
- ○ 15-pound
- ○ 30-pound
- ○ 50-pound

Question 4

Exterior landings at doors shall have a maximum slope of _____ unit vertical in 12 units horizontal.

- ○ 1/8
- ○ 1/4
- ○ 1/2
- ○ 1

Source: archicorner

Q10

Question 3

A fire-rated egress door shall move to a full-open position when subjected to a maximum _____ force.

- ○ 5-pound
- ● 15-pound
- ○ 30-pound
- ○ 50-pound

1010.1.3 Forces to unlatch and open doors. The forces to unlatch doors shall comply with the following:

1. Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (67 N).
2. Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).

Question 4

Exterior landings at doors shall have a maximum slope of _____ unit vertical in 12 units horizontal.

- ○ 1/8
- ● 1/4
- ○ 1/2
- ○ 1

1010.1.4 Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

Source: archicorner

Q10

Question 5

Alternating tread devices used as a means of egress shall have a maximum rise between floor levels or landings of _____ feet.

- ○ 10
- ○ 12
- ○ 15
- ○ 20

Question 6

The maximum permitted vertical rise of any ramp shall be _____ inches.

- ○ 30
- ○ 44
- ○ 48
- ○ 60

Source: archicorner

Q10

Question 5

Alternating tread devices used as a means of egress shall have a maximum rise between floor levels or landings of _____ feet.

- ○ 10
- ○ 12
- ○ 15
- ● 20

1011.14 Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in buildings of Groups F, H and S from a *mezzanine* not more than 250 square feet (23 m^2) in area and that serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m^2) in area and for access to unoccupied roofs. *Alternating tread devices* used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

https://www.youtube.com/watch?v=-ePyDMjGWz0

Question 6

The maximum permitted vertical rise of any ramp shall be _____ inches.

- ● 30
- ○ 44
- ○ 48
- ○ 60

1012.4 Vertical rise. The rise for any *ramp* run shall be 30 inches (762 mm) maximum.

Source: archicorner

Q10

Question 7

Only those ramps having a maximum rise of _____ inches are permitted without complying handrails.

- ○ 6
- ○ 12
- ○ 18
- ○ 24

Question 8

The space required between two doors in a series shall be a minimum of _____ inches plus the width of a door swinging into the space.

- ○ 30
- ○ 44
- ○ 48
- ○ 60

Source: archicorner

Q10

Question 7

Only those ramps having a maximum rise of _____ inches are permitted without complying handrails.

- (●) 6
- ( ) 12
- ( ) 18
- ( ) 24

1012.8 Handrails. *Ramps* with a rise greater than 6 inches (152 mm) shall have *handrails* on both sides. *Handrails* shall comply with Section 1014.

Question 8

The space required between two doors in a series shall be a minimum of _____ inches plus the width of a door swinging into the space.

- ( ) 30
- ( ) 44
- (●) 48
- ( ) 60

1010.1.7 Door arrangement. Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

Source: archicorner

Q10

Question 9 0.15 pts

A stairway serving an occupant load of 35 in an office suite shall have a minimum width of _____ inches

- ○ 30
- ○ 36
- ○ 42
- ○ 44

Question 10 0.15 pts

At ramps where handrails are not continuous between runs, the handrails shall extend horizontally a minimum of _____ inches beyond the top and bottom of the ramp.

- ○ 6
- ○ 8
- ○ 12
- ○ 18

Source: archicorner

Q10

Question 9

0.15 pts

A stairway serving an occupant load of 35 in an office suite shall have a minimum width of _____ inches

- ○ 30
- ● 36
- ○ 42
- ○ 44

1011.2 Width and capacity. The required capacity of *stairways* shall be determined as specified in Section 1005.1, but the minimum width shall be not less than 44 inches (1118 mm). See Section 1009.3 for *accessible means of egress stairways*.

Exceptions:

1. *Stairways* serving an *occupant load* of less than 50 shall have a width of not less than 36 inches (914 mm).

Question 10

0.15 pts

At ramps where handrails are not continuous between runs, the handrails shall extend horizontally a minimum of _____ inches beyond the top and bottom of the ramp.

- ○ 6
- ○ 8
- ● 12
- ○ 18

1014.6 Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent *flight of stairs* or *ramp* run. Where *handrails* are not continuous between flights, the *handrails* shall extend horizontally not less than 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the flights of *stairs* at *stairways* and the *ramp* runs at *ramps*.

Source: archicorner

Class 9:
Chapter 10, Sections 1001 through 1005, 1008, 1009, 1013 and 1015

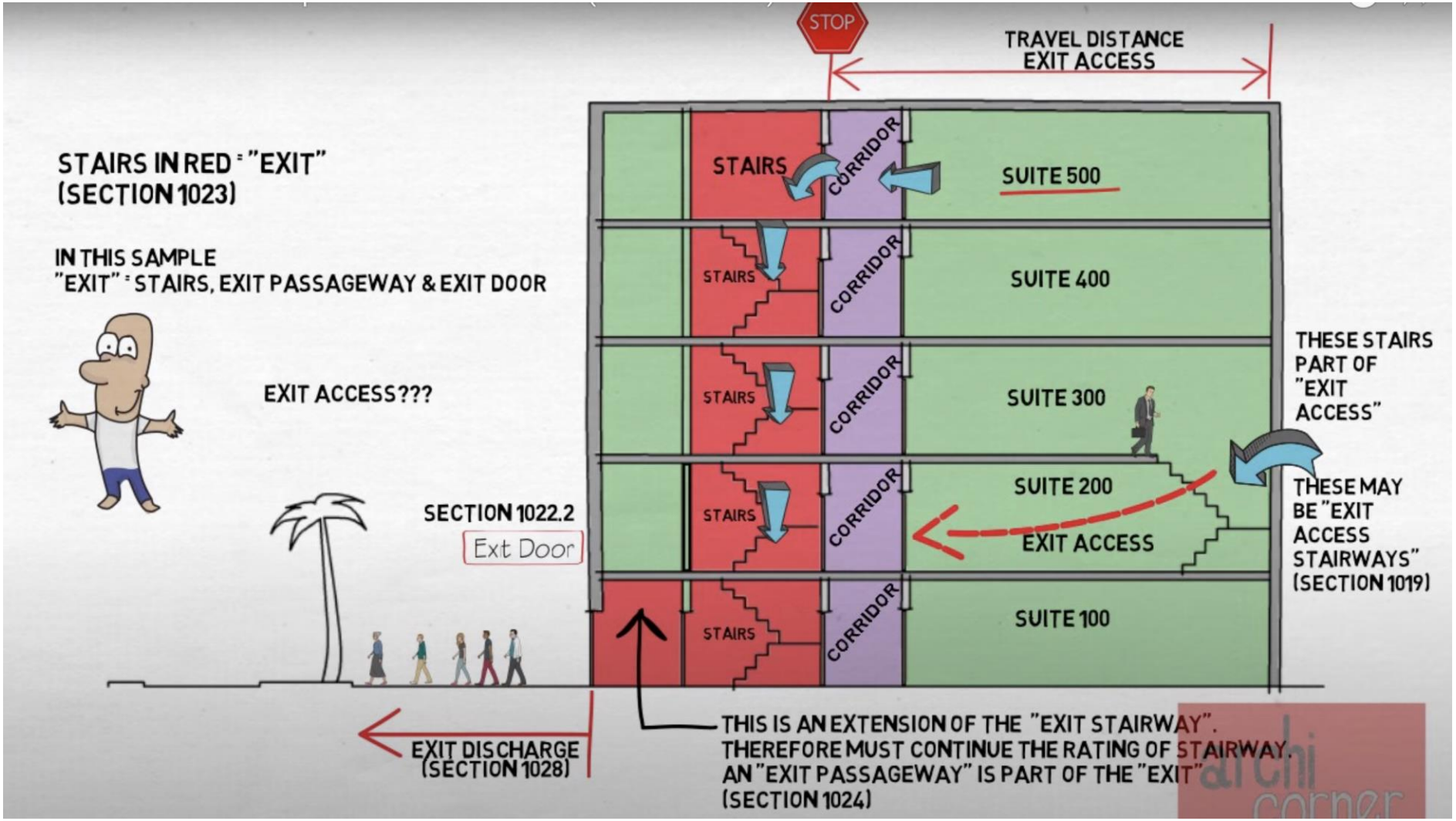
Source: 2021 IBC

Chapter Overview

Exit Access
Exit
Exit Discharge
Special Attention

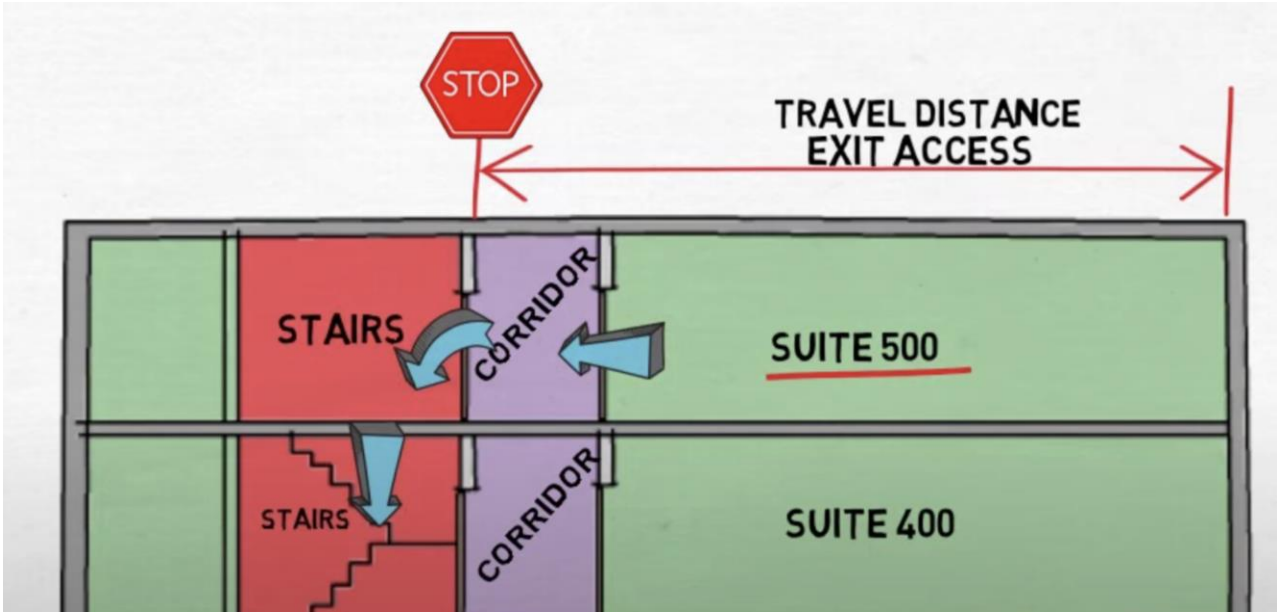
Source: 2021 IBC

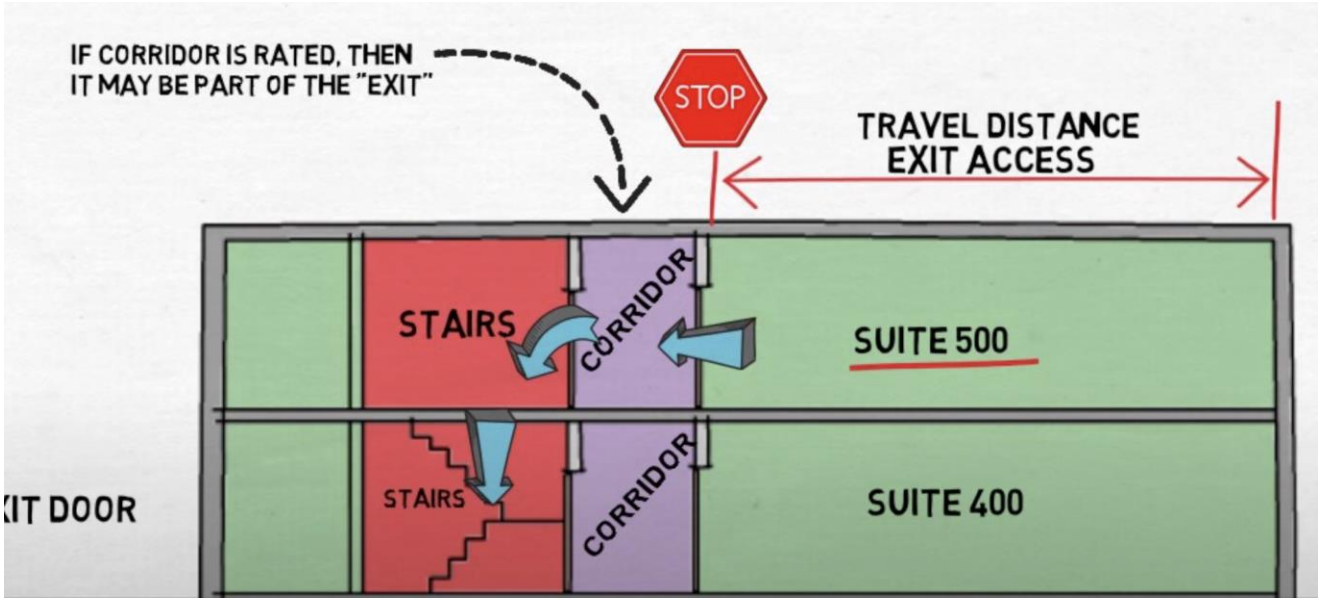
What is egress



Source: archicorner

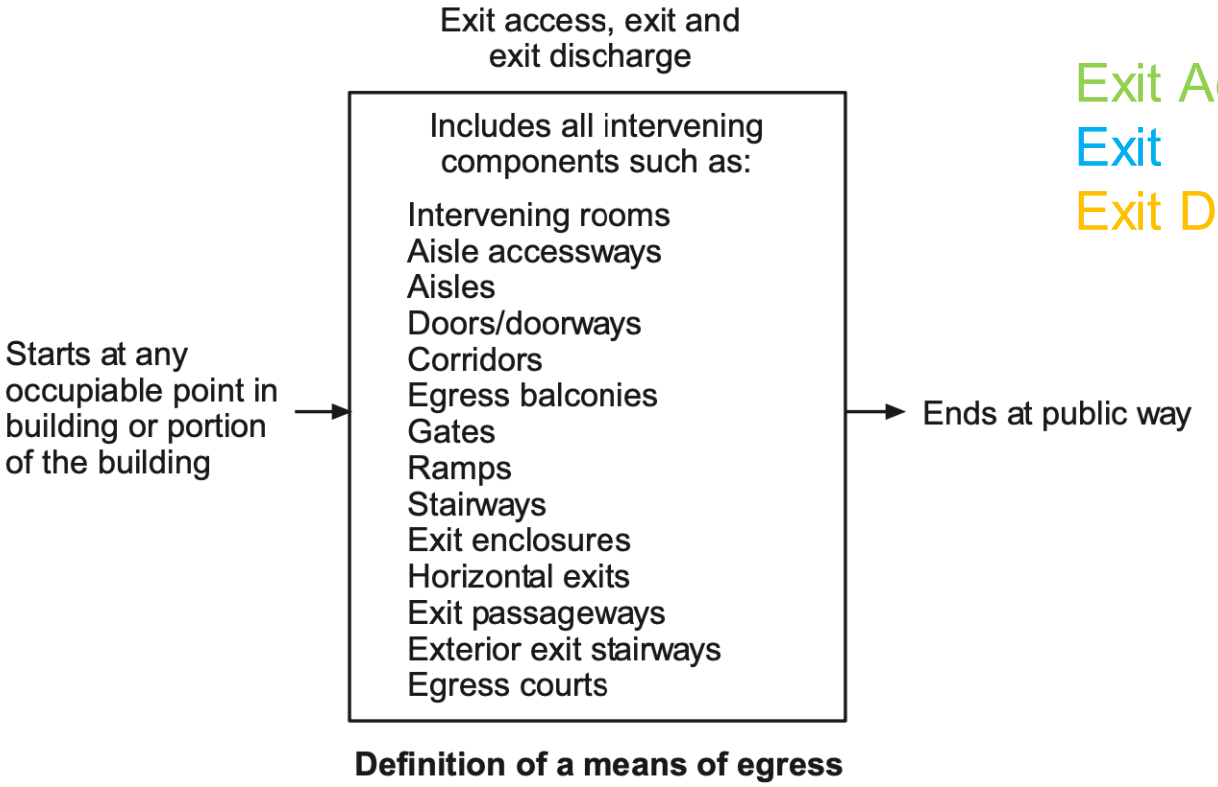
What is exit access vs exit





Source: archicorner

1001.1 General



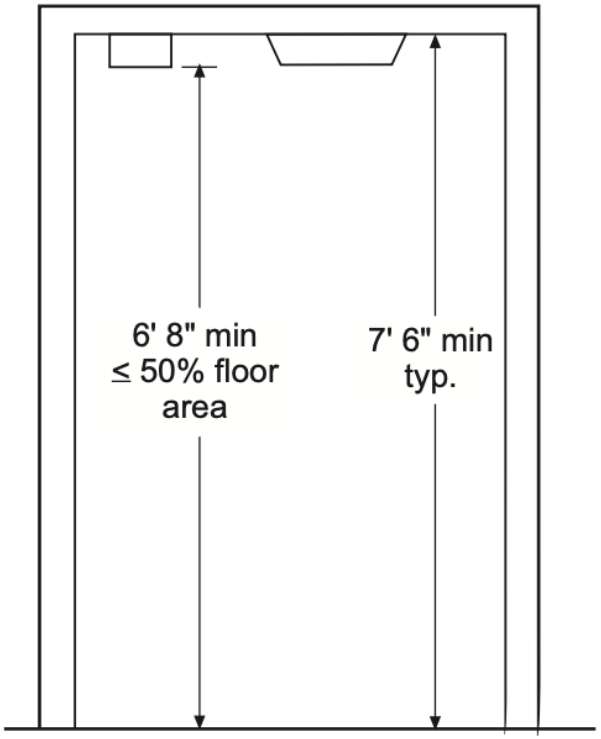
Definition of a means of egress

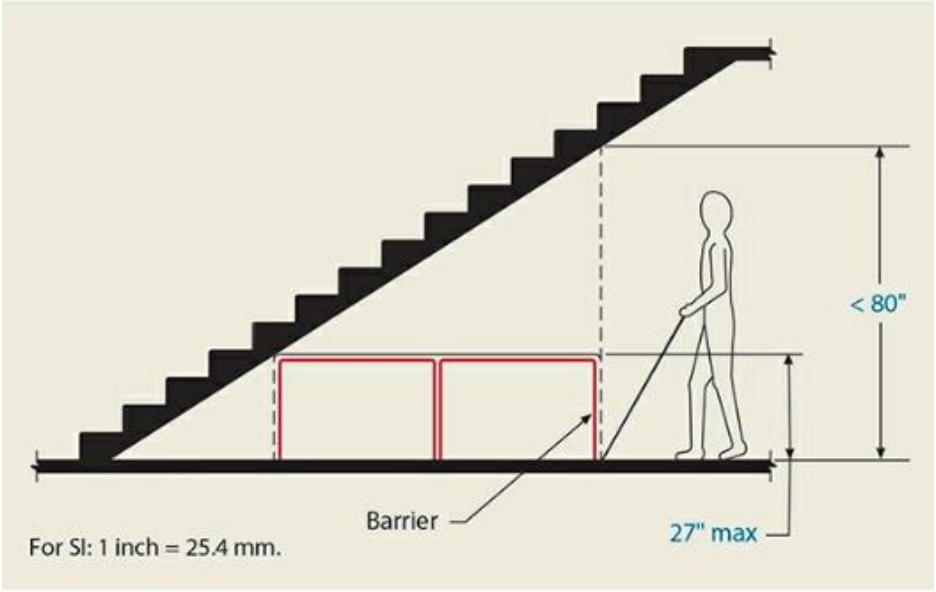
Building components along the path of egress travel might include aisle accessways, aisles, doors or doorways, intervening rooms, gates, corridors, ramps, exit access stairways, interior exit stairways, exit passageways, horizontal exits, exterior balconies, exterior exit stairways and egress courts.

Source: 2021 IBC

1003.2, Ceiling Height

Minimum Stairway Ceiling Height - Building Codes And Accident Prevention - YouTube





03-2 **Reduced vertical clearance.**

Corridor, aisle, passageway or any walking surface along egress of path travel

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

The minimum ceiling heights established for environmental concerns are addressed in Section 1208.2. Habitable spaces, such as bedrooms and living rooms in residential occupancies, occupiable spaces and corridors must be at least 7 feet 6 inches in height. In other areas, reduced headroom is permitted.

Source: 2021 IBC

1003.2, Ceiling Height

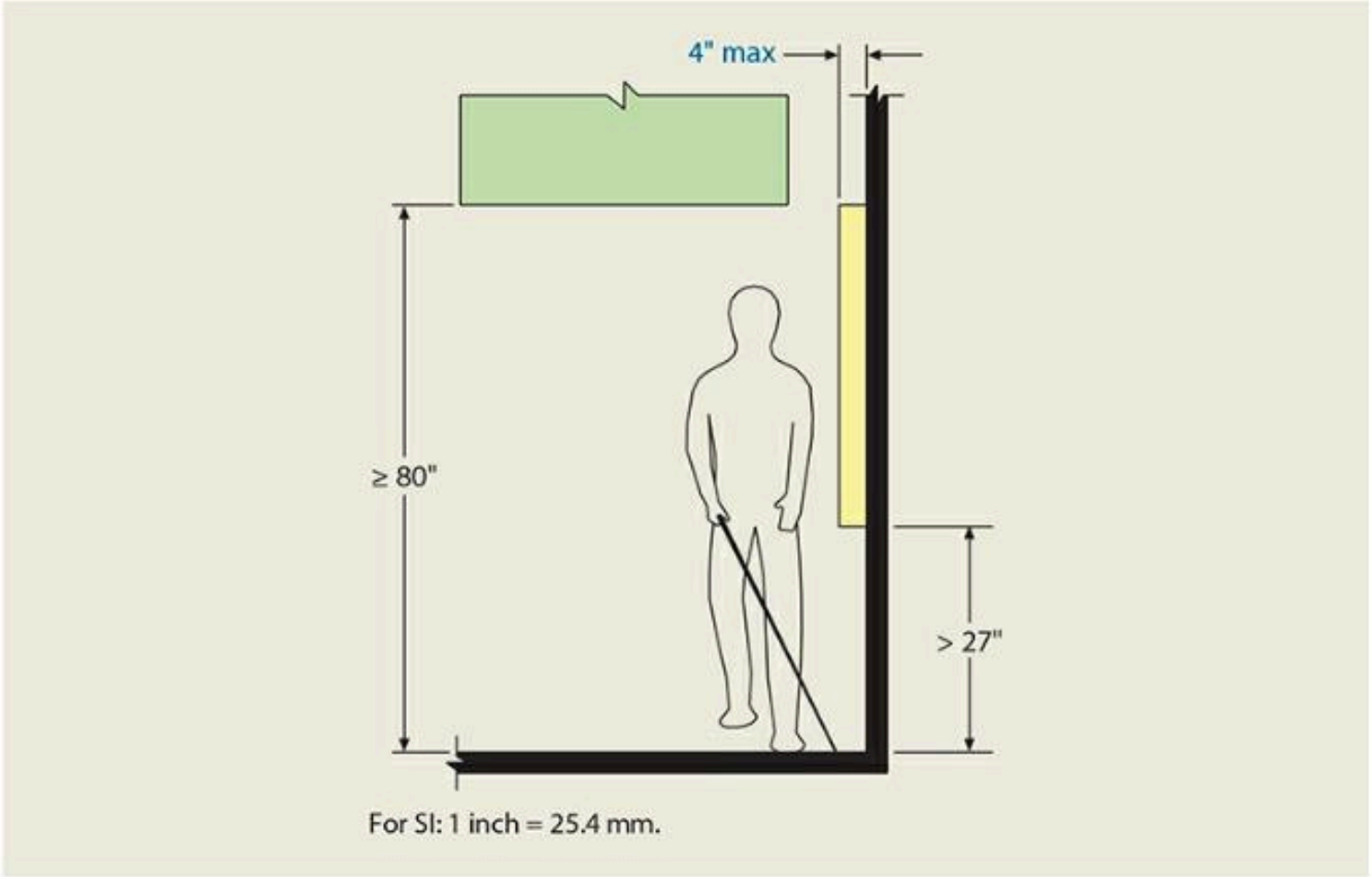


Figure 1003-4 **Limits of protruding objects.**

Source: 2021 IBC

1004.1, 1004.5 Design Occupant Load

AC 022 - Egress: How to calculate occupant loads (Part 2 of 2) - Gross vs. Net. Sq. Ft. - YouTube

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

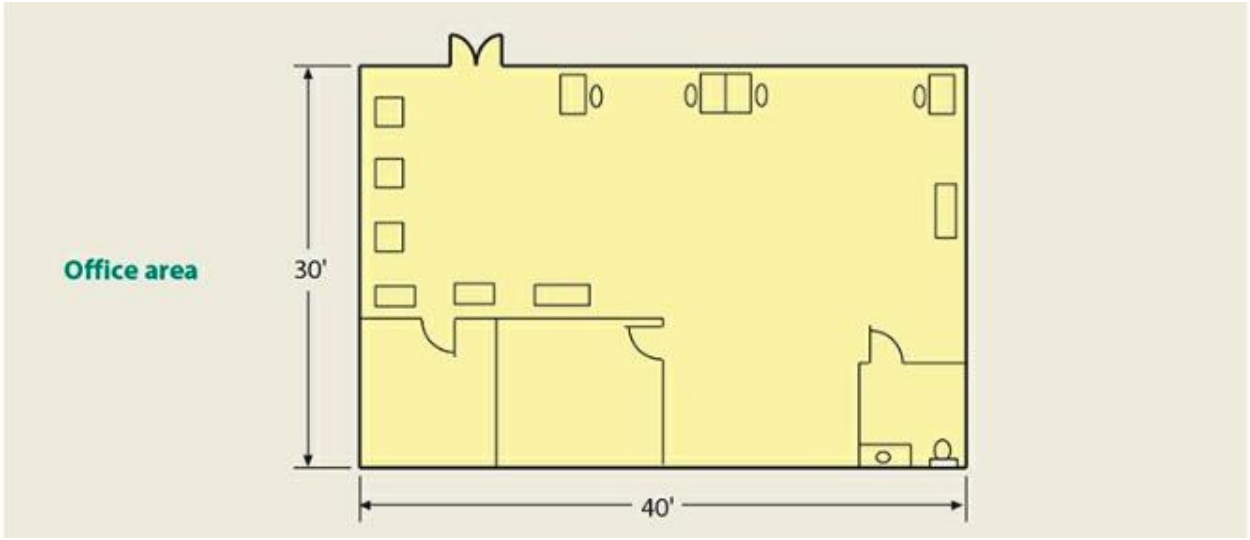
FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit gallery and museum	30 net
Assembly with fixed seats	See Section 1004.6
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	150 gross
Concentrated business use areas	See Section 1004.8
Courtrooms—other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
Group H-5 fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Locker rooms	50 gross
Mall buildings—covered and open	See Section 402.8.2
Mercantile	60 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

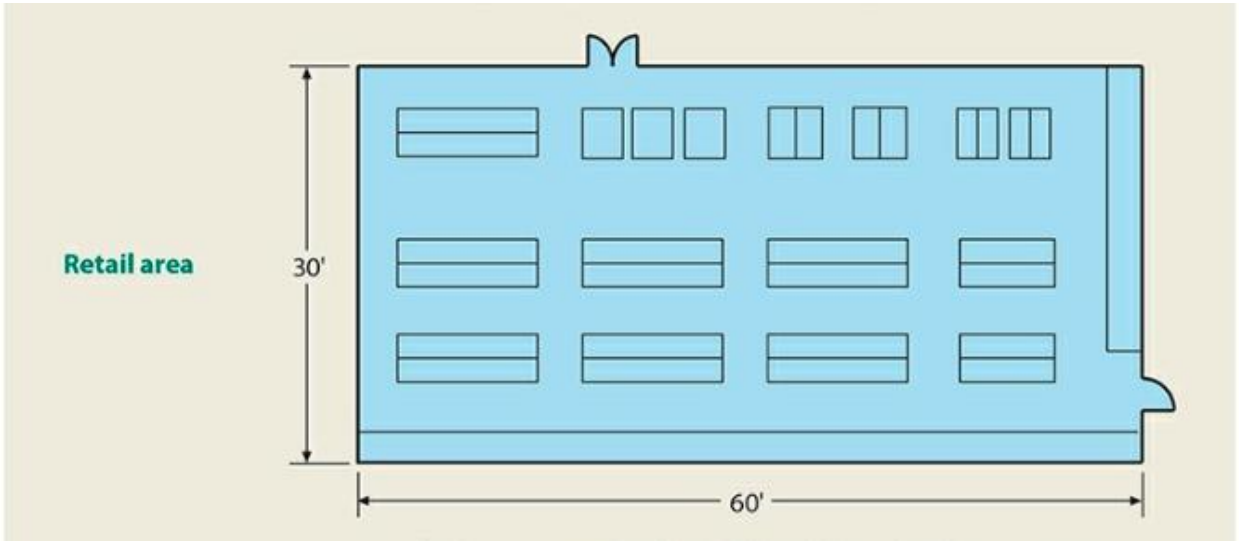
For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Floor area in square feet per occupant.

Source: 2021 IBC

1004.1, 1004.5 Design Occupant Load





Source: 2021 IBC

1004.1, 1004.5 Design Occupant Load

TABLE 1004.5
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FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
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Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
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Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit gallery and museum	30 net
Assembly with fixed seats	See Section 1004.6
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
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Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	150 gross
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Dormitories	50 gross
Educational	
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Group H-5 fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Locker rooms	50 gross
Mall buildings—covered and open	See Section 402.8.2
Mercantile	60 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Floor area in square feet per occupant.

Source: 2021 IBC

1004.1, 1004.5 Design Occupant Load

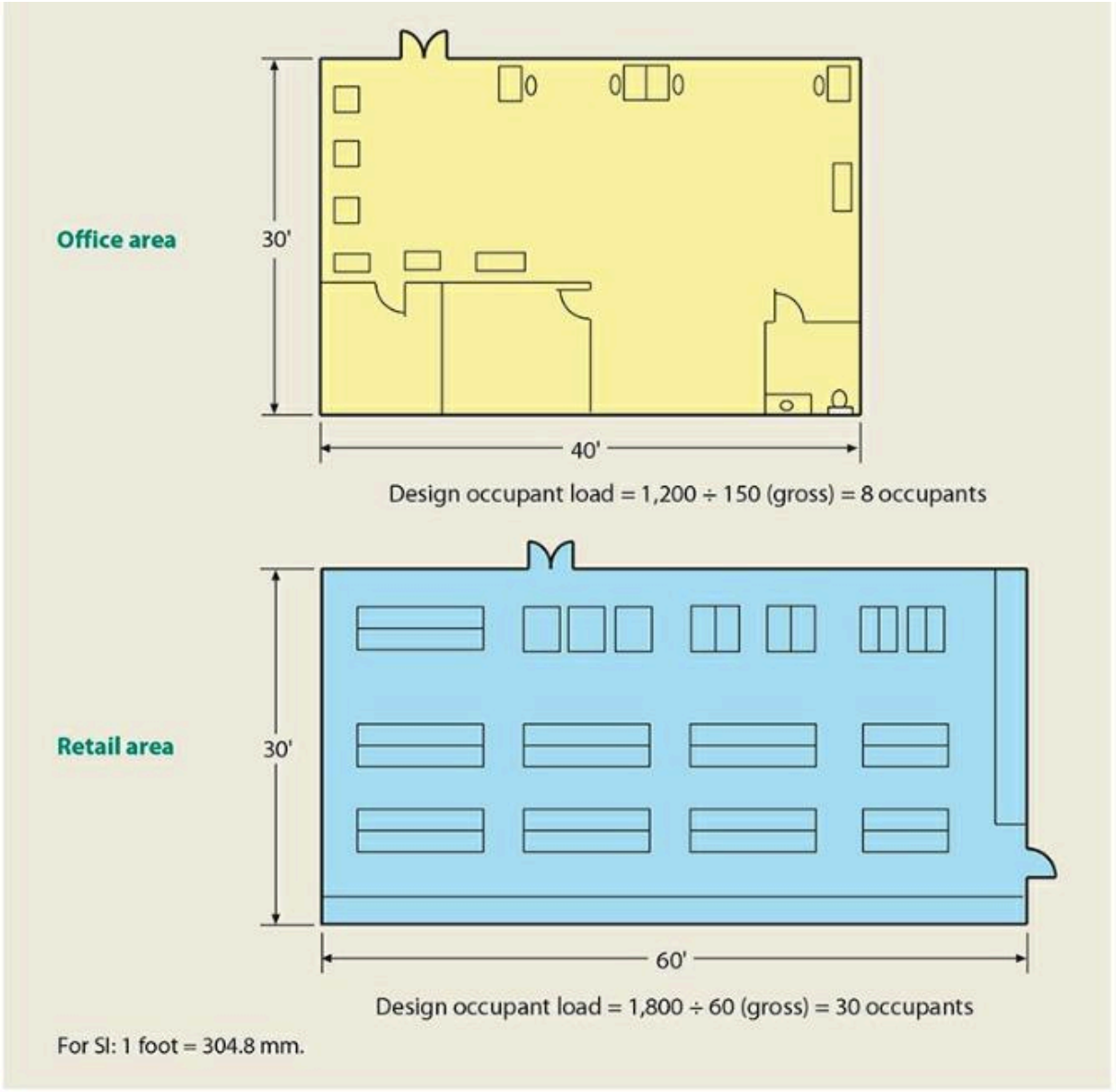


Figure 1004-5 **Design occupant load examples.**

Source: 2021 IBC

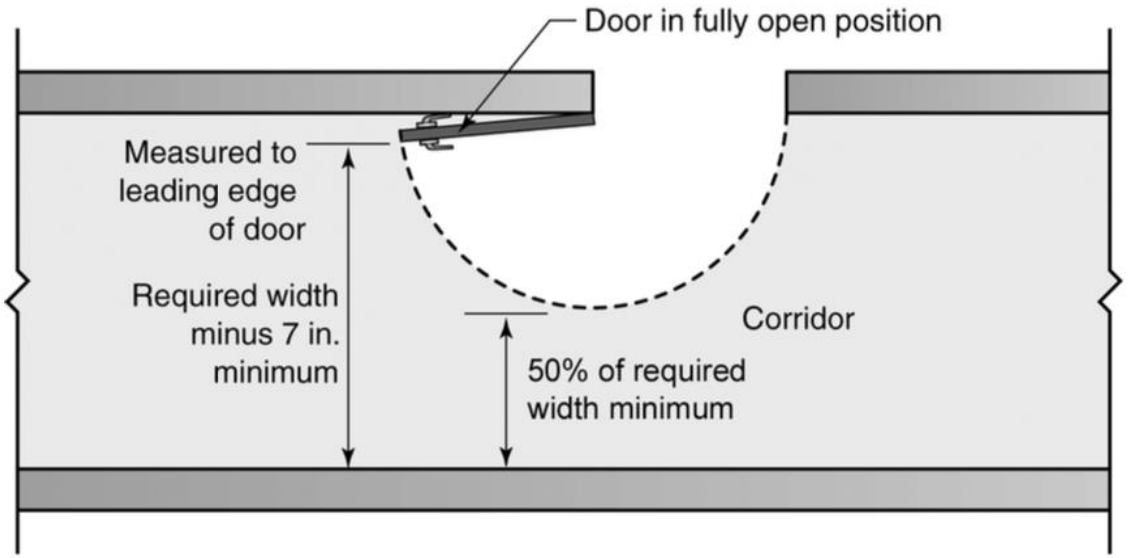
1005.2, 1005.3 Width and Capacity

- The minimum width, in inches, of any means of egress components shall not be less than that specified for such component, elsewhere in the IBC. The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inches (7.6 mm) per occupant. The capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inches (5.1 mm) per occupant. See the exceptions that reduce the capacity factors to 0.2 inches and 0.15 inches, respectively, for buildings equipped throughout with an automatic sprinkler system and an emergency voice/alarm communication system.
- In a given means of egress system, different components will afford different capacities. The most restrictive component will establish the capacity of the overall system. Doorways, aisles, stairways and corridors also have minimum established widths that must be provided.

Source: 2021 IBC

1005.2, 1005.3 Width and Capacity

AC 011 - Egress: How to Calculate Egress Widths. - YouTube



Measurement of minimum required egress width
Section 1005.7.1

Width, in terms of a means of egress system or component, is the clear, unobstructed usable width afforded along the exit path by the individual components. Unless the code provides for a permitted projection, the minimum required clear width may not be reduced throughout the travel path.

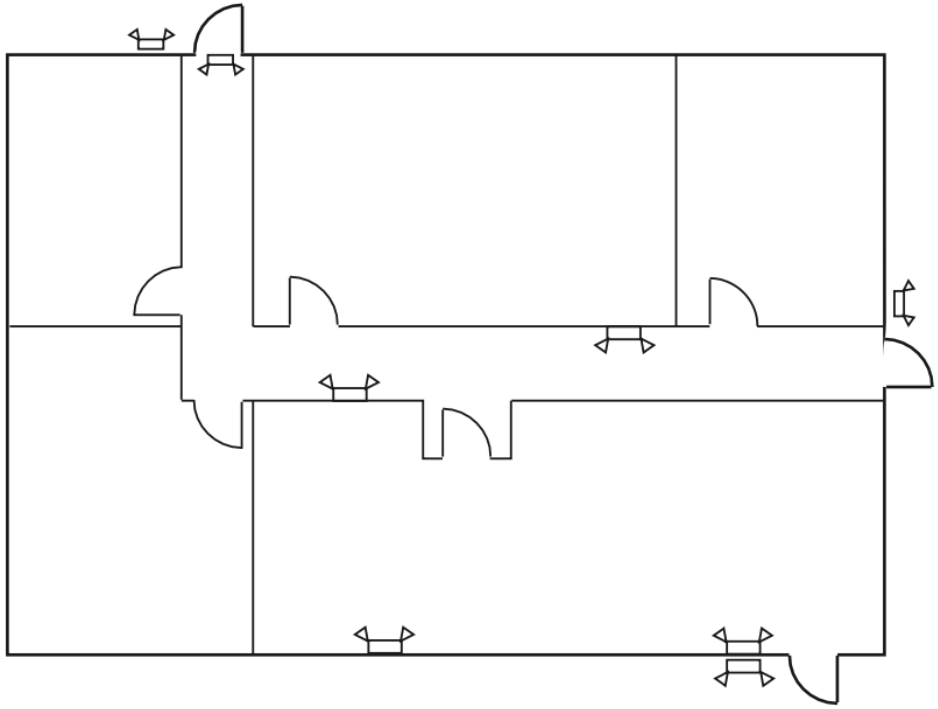
Source: 2021 IBC

1008.2, 1008.3 Emergency Power

- The means of egress serving a room or space shall be illuminated at all times that the room or space is occupied. See the exceptions for (1) Group U occupancies; (2) aisle accessways in Group A; (3) dwelling and sleeping units in Groups R-1, R-2 and R-3; and (4) sleeping units of Group I. The power supply for means of egress illumination shall normally be provided by the premises electrical supply. In the event of power supply failure in rooms and spaces that require two or more means of egress, an emergency electrical system shall automatically illuminate all of the following areas: (1) aisles, (2) corridors and (3) exit access stairways and ramps. Additional requirements for emergency power for illumination is required for buildings that require at least two means of egress and for special spaces such as fire pump rooms and large public restrooms.
- Often identified as emergency lighting, a completely separate source of power from the premise's wiring system is required when the life-safety risk in a building becomes sufficiently great. This threshold is recognized as the point at which the occupant load of the room, area or building is high enough so that two means of egress are required.

Source: 2021 IBC

1008.2, 1008.3 Emergency Power



For the building occupant to be able to negotiate safely the means of egress system, the entire system must be illuminated any time the building is occupied. The illumination must provide an intensity of at least one foot-candle at the floor level. Stairway walking surfaces must be provided with at least 10 footcandles of illumination when the stairway is in use.

Source: 2021 IBC

1009.1, 1009.2 General

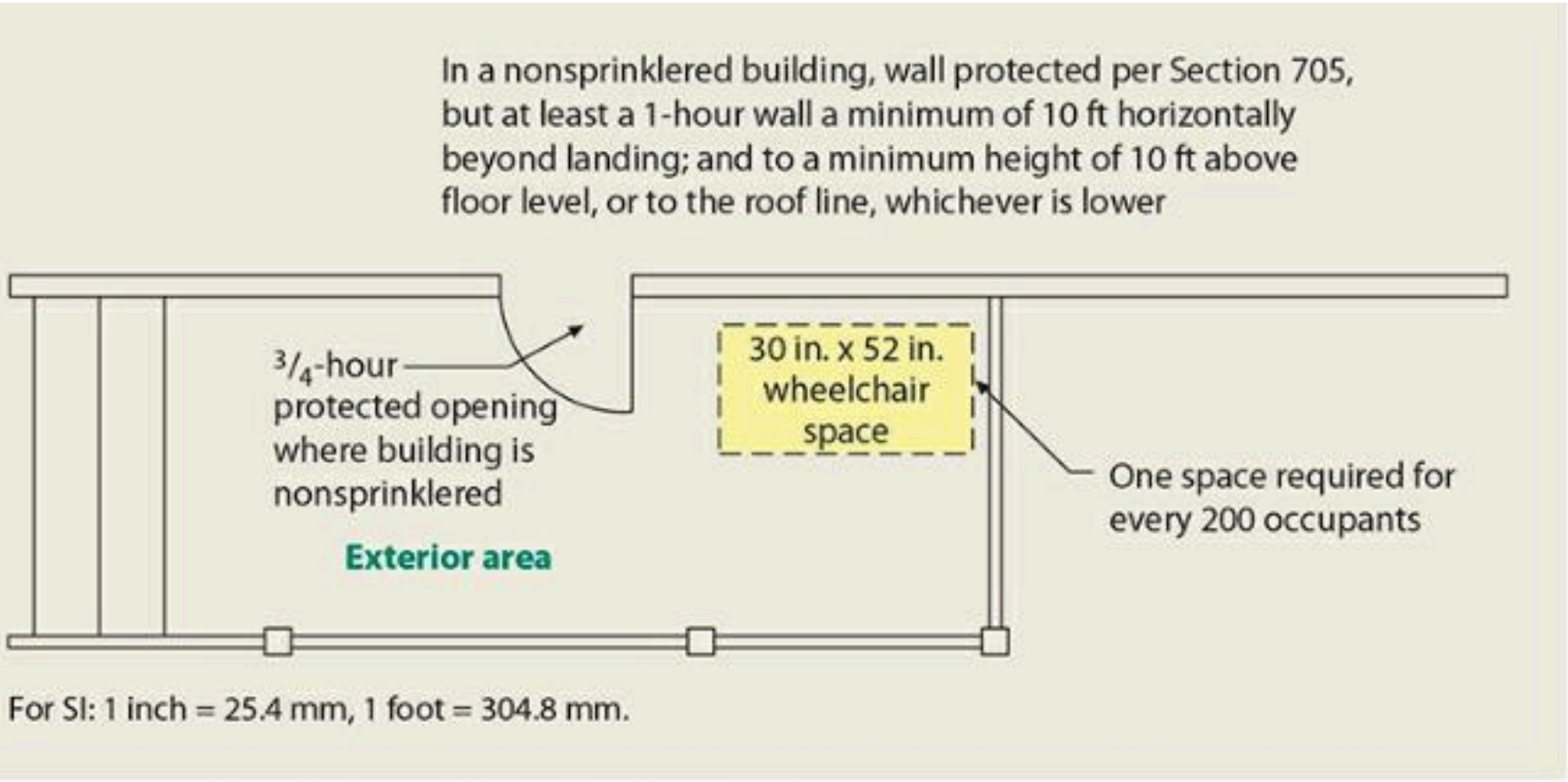
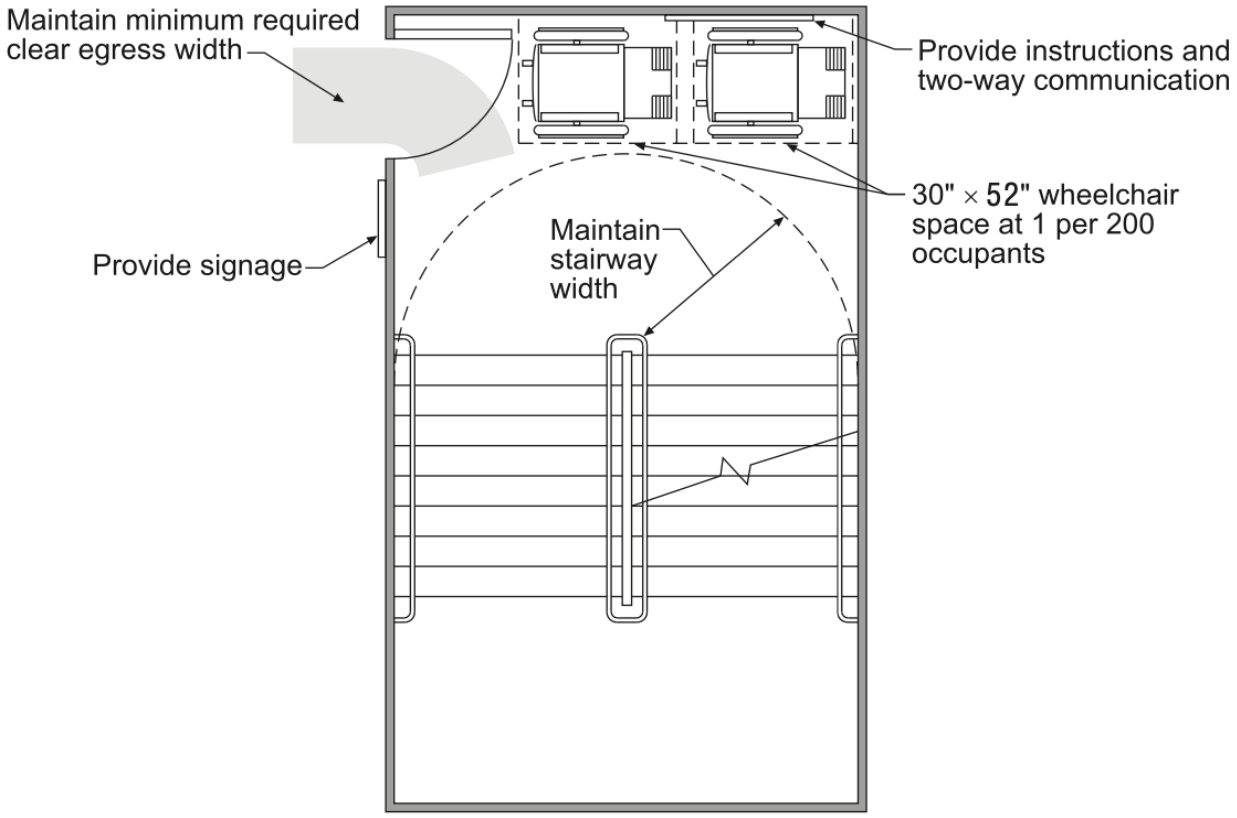


Figure 1009-2 Exterior area for assisted rescue.

Exterior stairways and nonaccessible exit discharge areas may be served by exterior areas for assisted rescue. These specific exterior refuge areas must be adequately separated from the interior of the building by fire-resistance-rated construction and fire-protected openings.

Source: 2021 IBC

1009.6 Areas of Refuge



For SI: 1 inch = 25.4 mm.

Required areas of refuge

Although three or more means of egress from an accessible space may be required, only two of the exitways must be accessible. However, where an area of refuge is used as part of the egress system, the maximum travel distance set forth in Section 1017.2 must be maintained.

Source: 2021 IBC

1009.8 Where Required: Two Way Communication

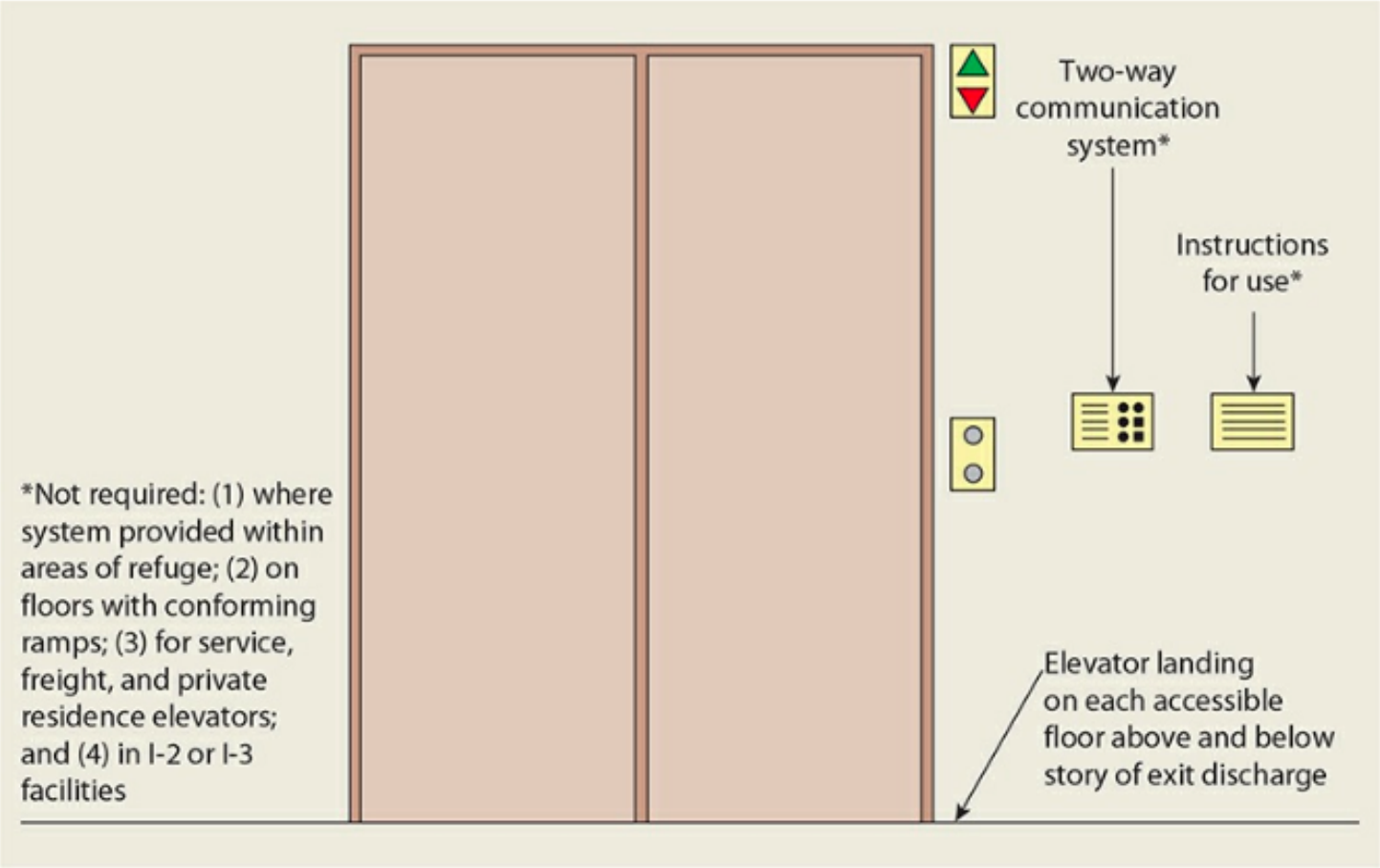


Figure 1009-3 Two-way communication system at elevator landing.

The provisions of Section 1009.6.5 require that all areas of refuge be provided with a two-way communication system. The specific requirements for the system are the same as those for the two-way communication systems mandated at elevator landings as set forth in Section 1009.8.

Source: 2021 IBC

1010.6 Floor Elevations (Details in CH 11)

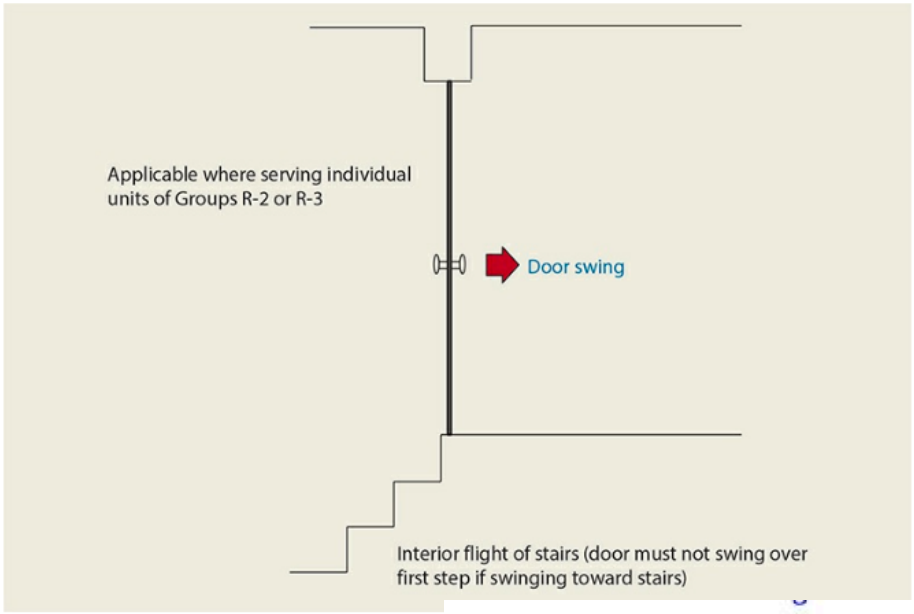


Figure 1010-6 **Floor level at doors.**

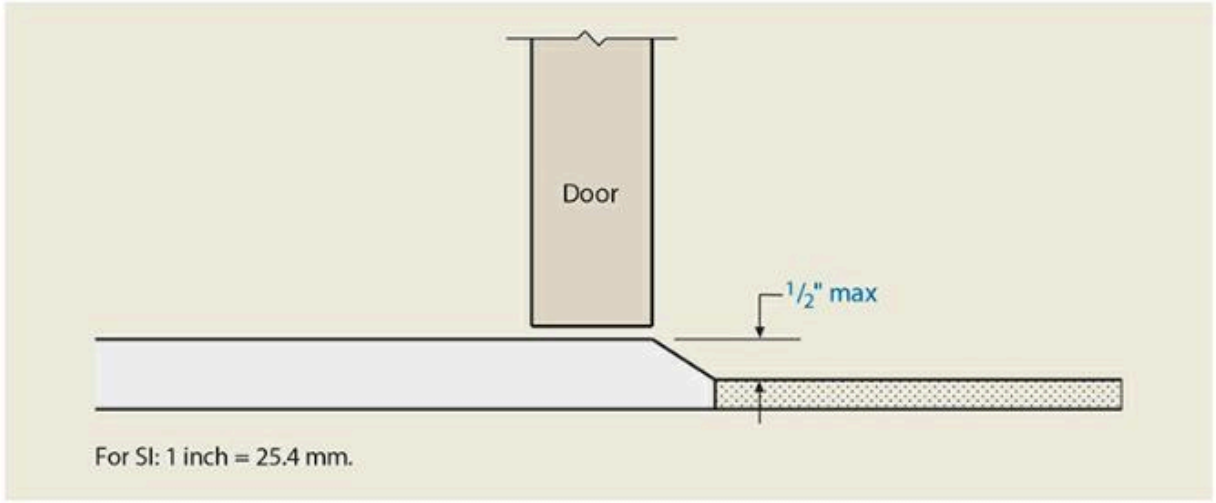
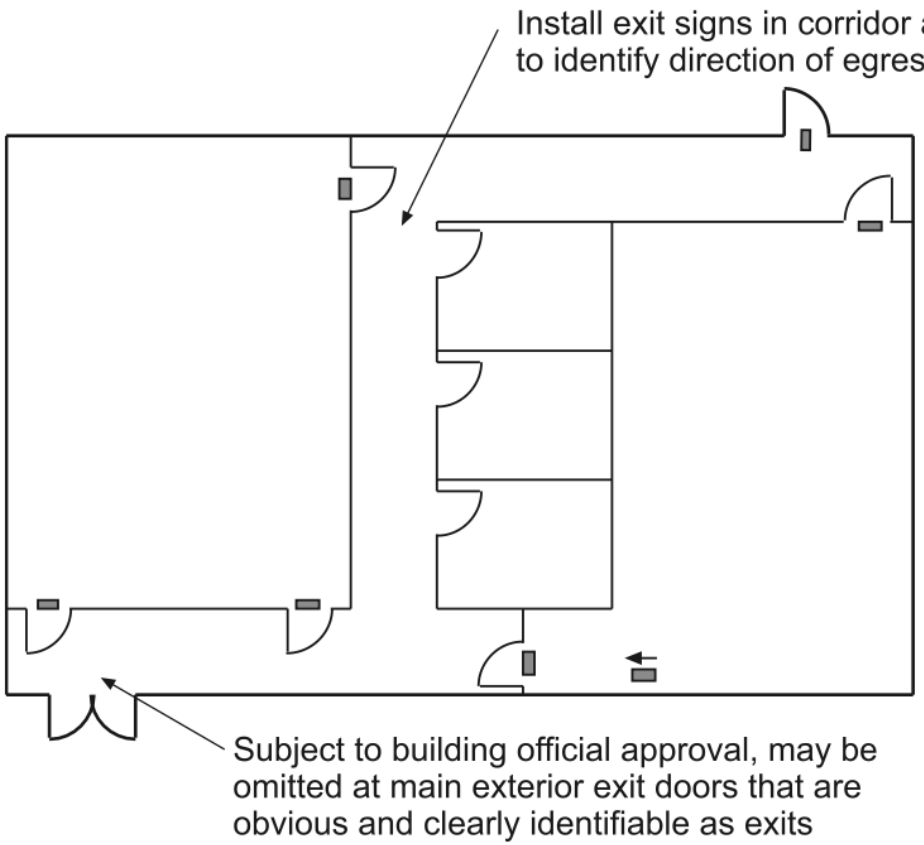


Figure 1010-5 **Floor elevation.**

Source: 2021 IBC

1013.1 Where Required: Exit Signs



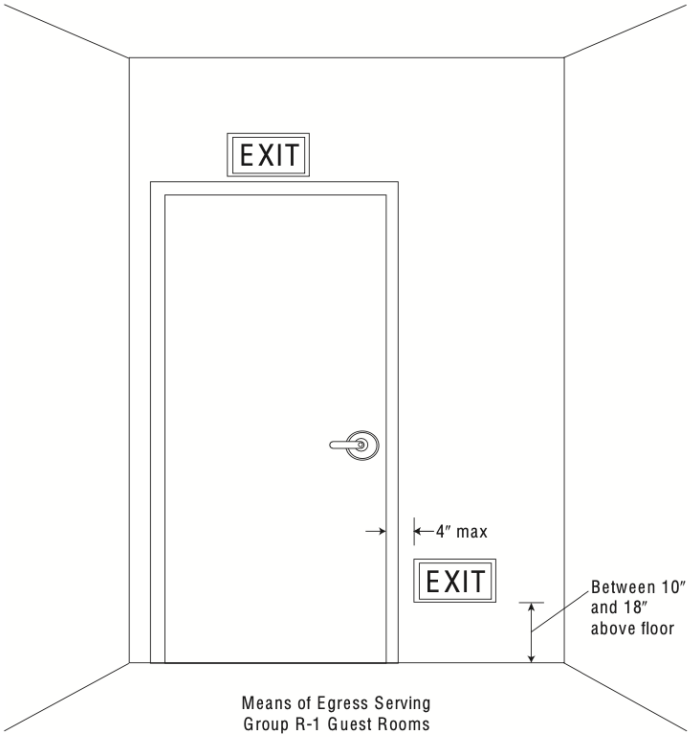
[A Brief History of the Exit Sign | ARTiculations - YouTube]

Additional exit signs may be necessary in lengthy exit access corridors and exit passageways to reinforce the direction of egress travel. It is possible that individuals subjected to extended travel would question the availability of an exit and attempt to locate an alternative egress path.

Source: 2021 IBC

1013.2 Low-level Signs in Group R-1

Exit Sign: Comment Responses | ARTiculations - YouTube



Low-level exit signs must be either electrically powered, self-luminous or photoluminescent exit signs that are listed and labeled in accordance with UL 924 and installed in accordance with the manufacturer's instructions. Consistent with the requirements for all other exit signs, low-level signs shall be illuminated at all times.

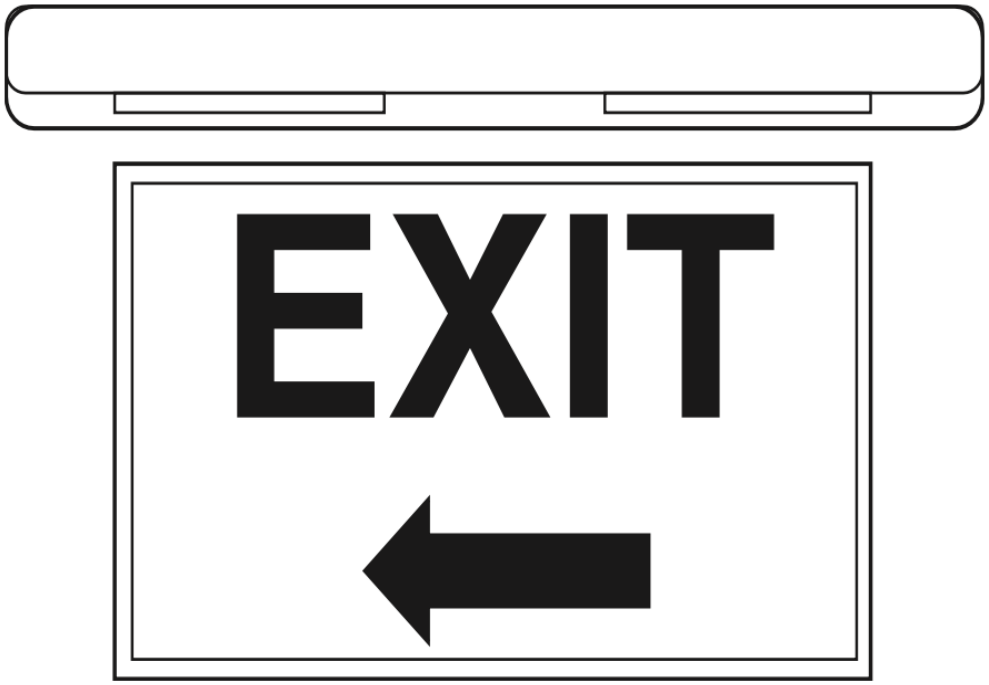
Source: 2021 IBC

1013.3, 1013.6.3 Illumination and Power Source

- Exit signs shall be internally or externally illuminated. See the exception for tactile signs. Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency system provided from storage batteries, unit equipment or an on-site generator.
- To ensure visibility under all conditions, required exit signs must always be illuminated. For those signs that are internally illuminated, which make up the vast majority of exit signs, compliance with UL 924 is mandated. Such exit signs, which includes electrically- powered, self-luminous and photo luminescent signs, must be listed and labeled. In addition, they must be installed in accordance with the manufacturer's installation instructions.

Source: 2021 IBC

1013.3, 1013.6.3 Illumination and Power Source



Externally-illuminated exit signs are regulated through prescriptive requirements addressing the sign's graphics, illumination and power source. The word "EXIT" must be at least 6 inches in height, and at least 5 foot-candles of external illumination must be provided.

Source: 2021 IBC

1014 Guard and Hand Rail

[When Do You Install A Guardrail or Handrail When Building Stairs? - Builders Education And Safety - YouTube]

[Code Compliance for Handrails and Guardrails - YouTube]

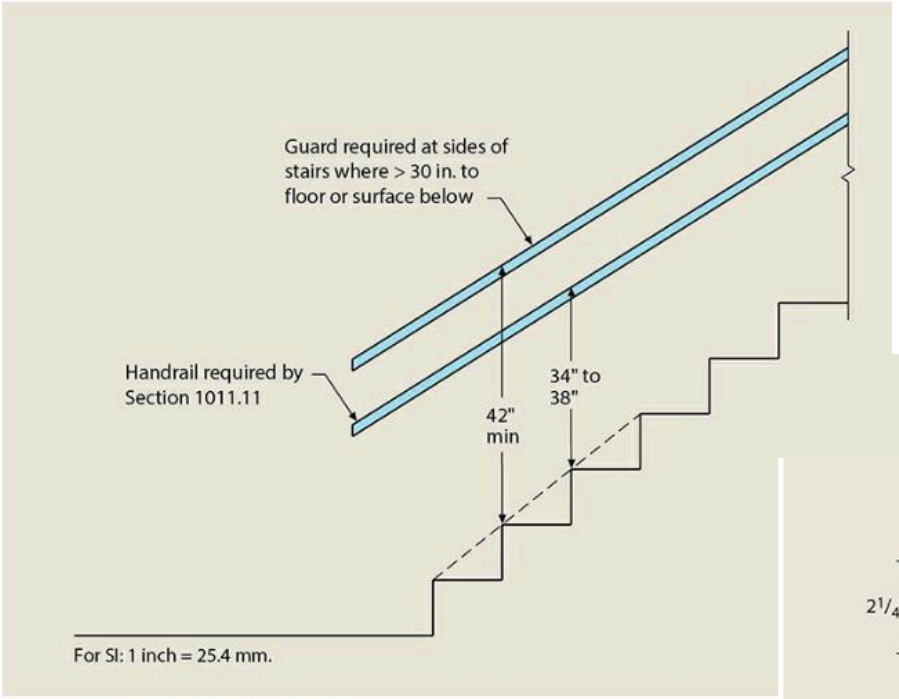


Figure 1014-1 **Guard and handrail.**

Figure 1014-6 **Ramp handrail extensions.**

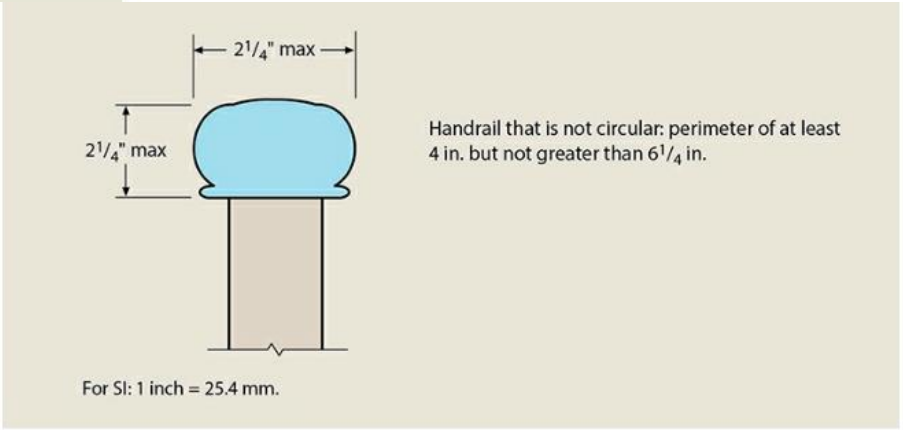


Figure 1014-2 **Noncircular handrail.**

Source: 2021 IBC

1028 Exit Discharge

Exits are intended to discharge directly to the exterior of the building. Three exceptions permit the exit path to include a portion of the building beyond the exit component. An exception to the requirements for the continuity of interior exit stairways (and ramps) is permitted where a maximum of 50 percent of the exits pass through areas on the level of exit discharge. The path of travel to the exterior must be unobstructed and easily recognized. Sprinkler protection is required for the egress path between the termination of the interior exit stairway to the building's exterior, as is fire-resistance-rated construction isolating any areas below the discharge level.

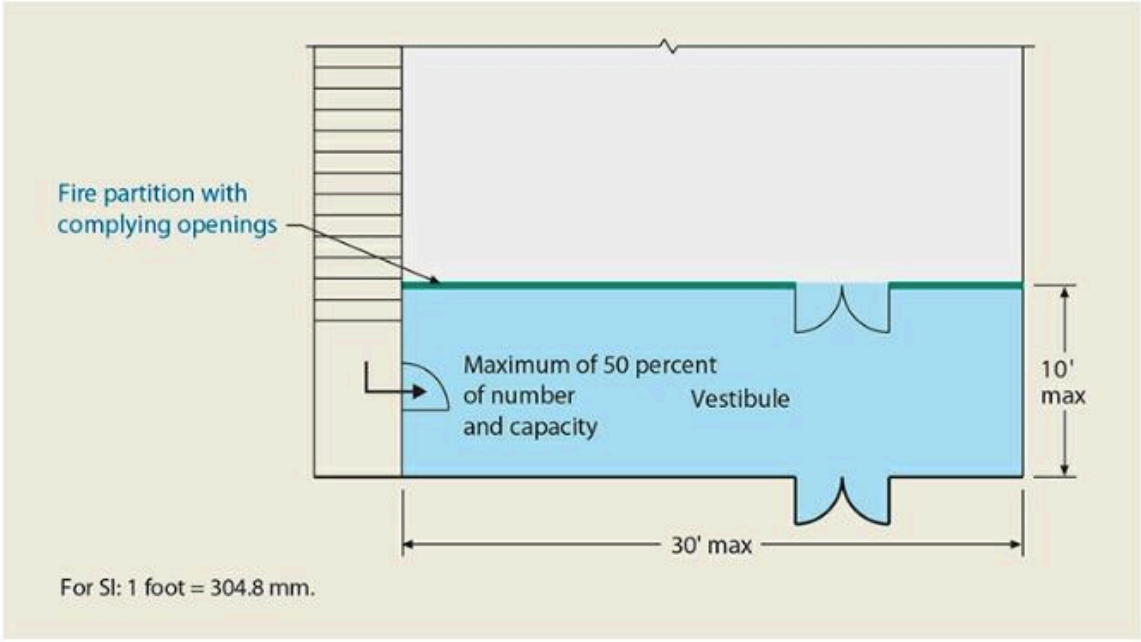


Figure 1028-2 **Exit discharge through vestibule.**

Source: 2021 IBC

Class 10:
Chapter 10, Sections 1010 through 1012 and 1014

Source: 2021 IBC

1001 Objective

- To obtain an understanding of the general system design requirements of a means of egress system, including the determination of occupant load, the required width and capacity of egress components, means of egress identification and illumination, accessible means of egress and the provisions regulating guards.

Source: 2021 IBC

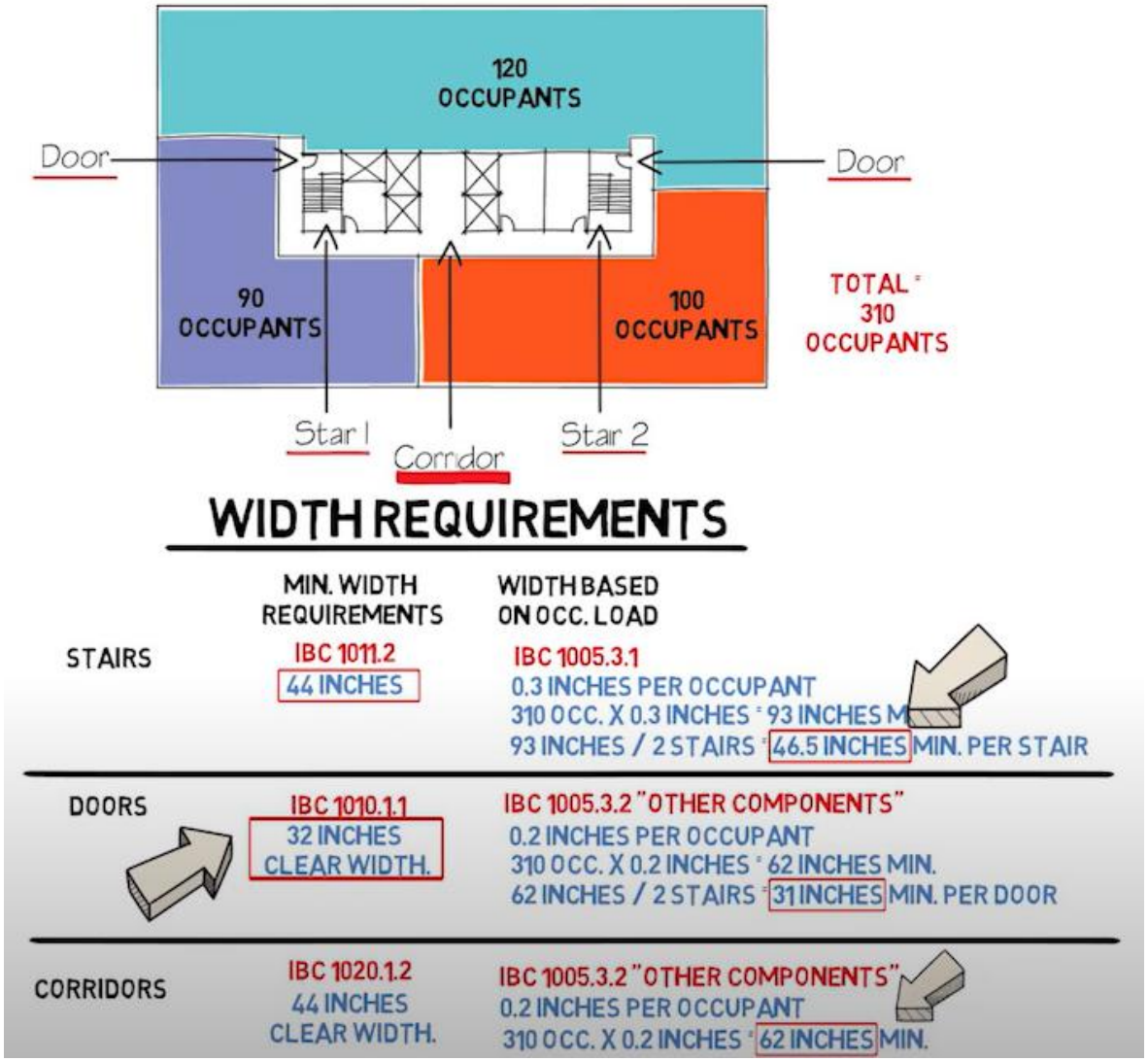
Chapter Overview

Exit Access
Exit
Exit Discharge
Special Attention

[AC 027 - IBC requirements: What is the required distance between exit doors? - YouTube]

Source: 2021 IBC

1010 Objective



Source: 2021 IBC

1010 Objective

- To obtain an understanding of the general system design requirements of a means of egress system, including the determination of occupant load, the required width and capacity of egress components, means of egress identification and illumination, accessible means of egress and the provisions regulating guards.

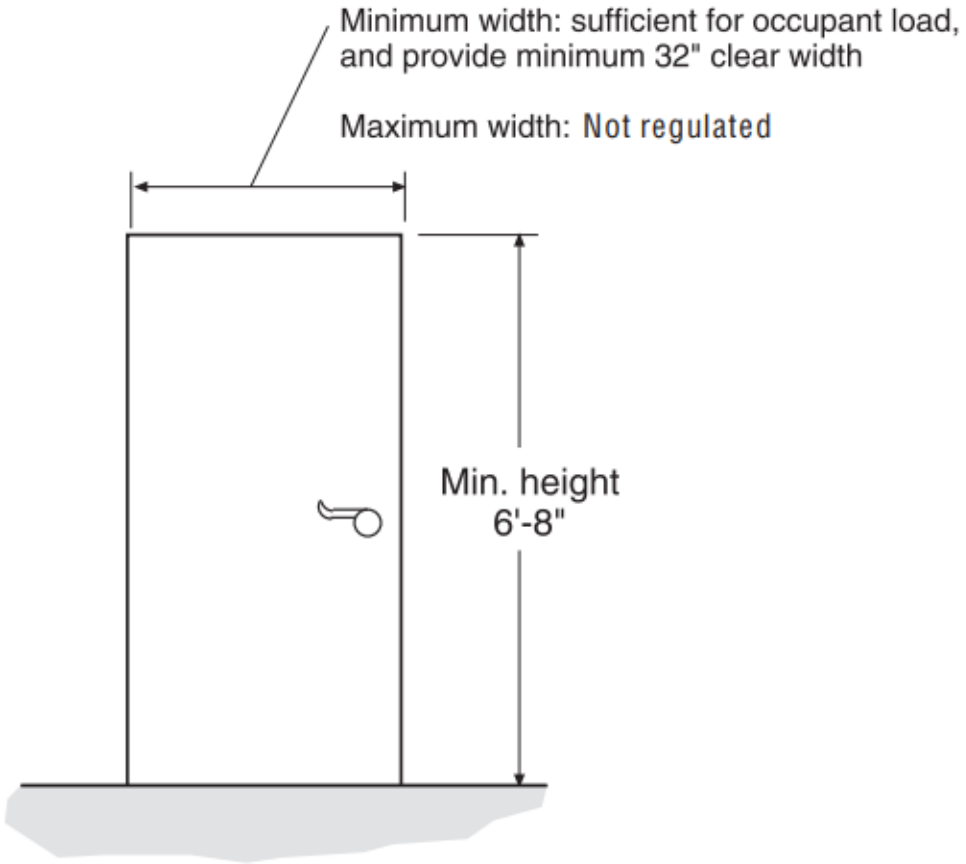
AC 030 - Occupant Load vs Occupancy Groups - YouTube

AC 029 - Number of Exits, Travel Distance & Common Path of Travel - YouTube

Calculating Occupant Loads and Egress Width - YouTube

Source: 2021 IBC

1010.1 Additional Doors and Identification



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

In accordance with Section 1022.2, any building or structure used for human occupancy must have at least one exterior door opening that complies with the minimum width (32 inches) and height (80 inches) requirements of Section 1010.1.1.

Source: 2021 IBC

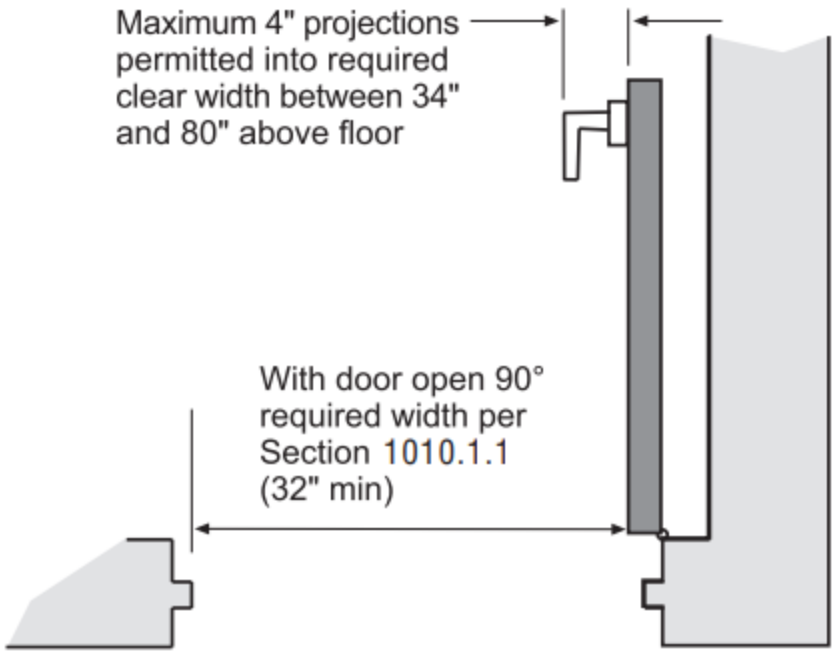
1010.1.1 Sizes of Doors

- The required capacity of each door opening shall be sufficient for the occupant load thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The minimum clear opening height of doors shall not be less than 80 inches (2032 mm). See the exceptions for clear opening width.
- A clear width of 32 inches is required only to a height of 34 inches above the floor or ground. Beyond this point, projections up to 4 inches into the required width are permitted. Although a single doorway is expected to be used for the egress of one individual at a time, it must also be of adequate width for wheelchair users.

Optional Decoded: Egress Requirements for Door Openings - YouTube

Source: 2021 IBC

1010.1.1 Sizes of Doors



Egress width at doors is net dimension

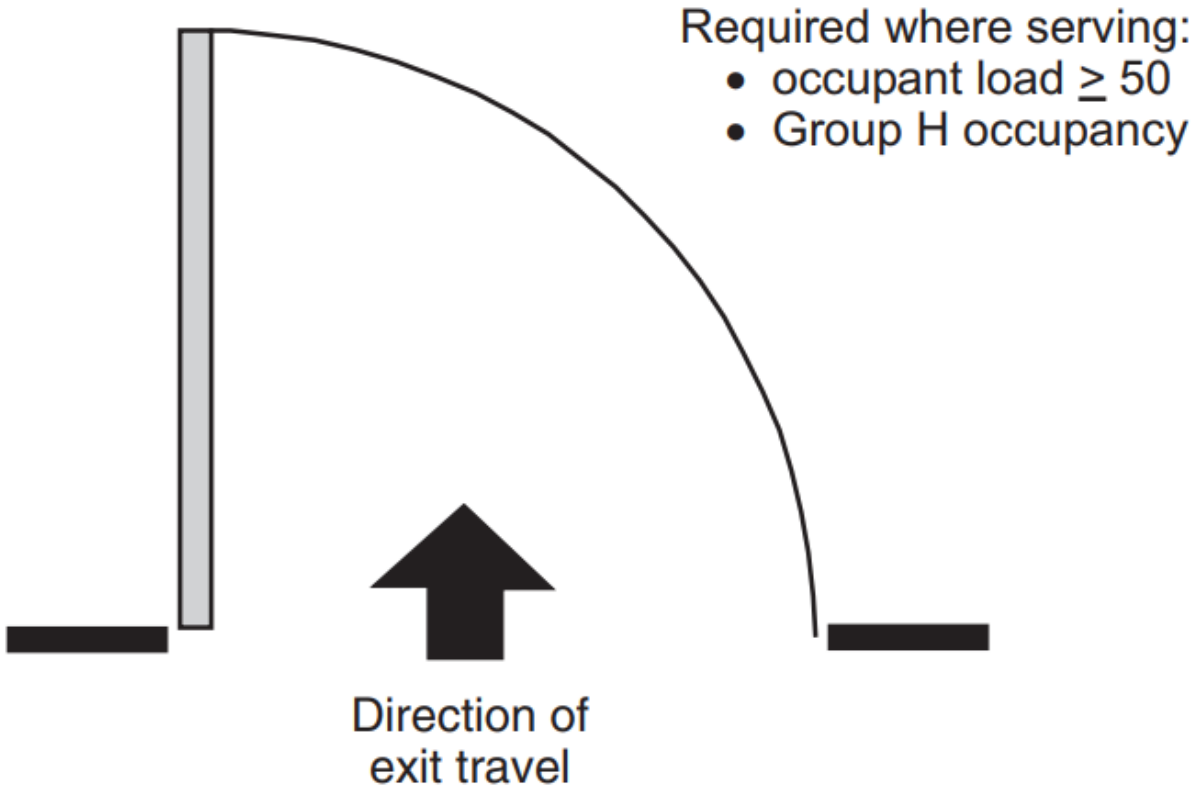
For SI: 1 inch = 25.4 mm, 1 degree = 0.01745 rad.

The maximum width of a door leaf is not regulated by the code. It is expected that a reasonable door opening effort is addressed in Section 1010.1.3 through the regulation of force levels necessary to unlatch and open a door.

Source: 2021 IBC

1010.1.2 Sizes of Doors

Which Doors Can Swing or Open Over A Stairway? - Building Code Information - YouTube

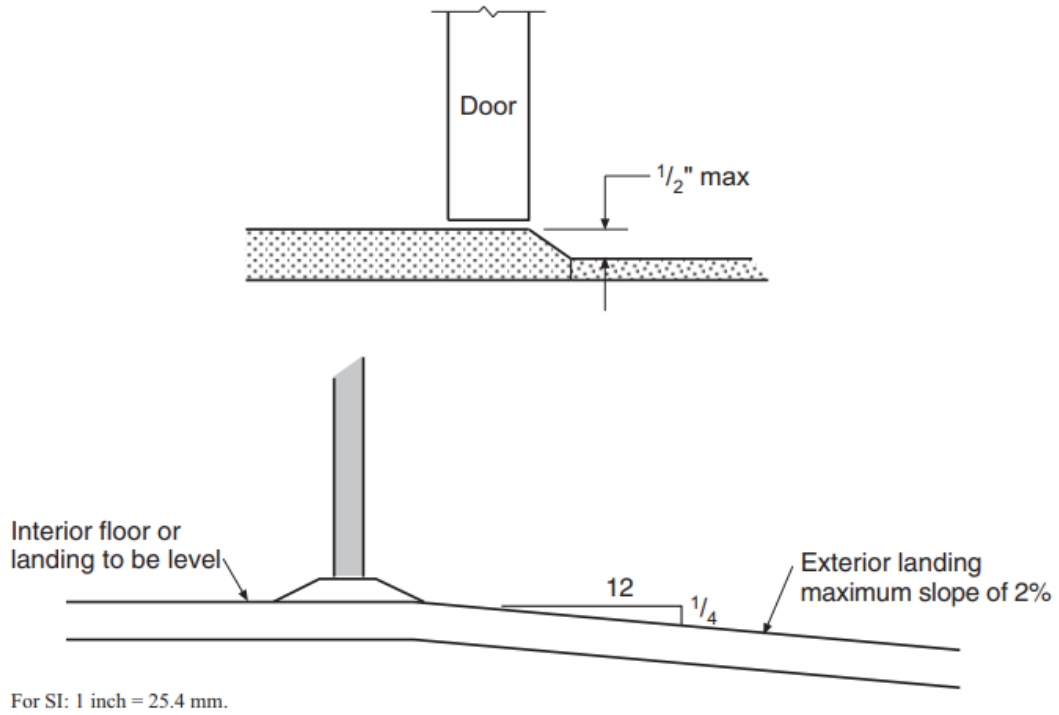


The maximum force needed to unlatch doors in the means of egress is regulated for two conditions: where door hardware operates by push or pull, and where door hardware operates by rotation. The force required to open the door is regulated based on the specific door type.

Source: 2021 IBC

1010.1.4 Floor Elevation

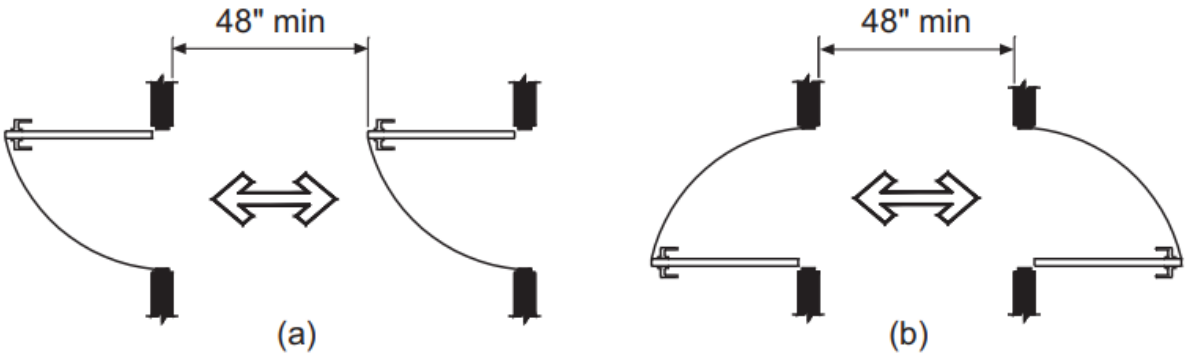
Forensic Architecture Elevation Changes in International Building Code. - YouTube



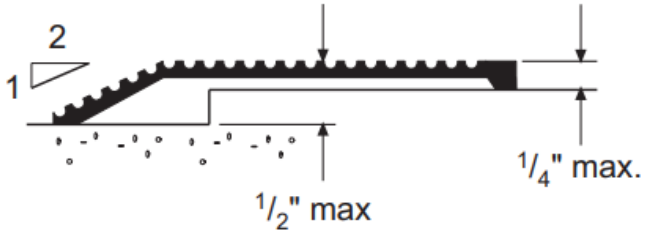
For interior situations, landings should be level. In exterior applications, landings may have a slope not to exceed $^1/_4$ unit vertical in 12 units horizontal (1:48). This maximum slope of 2 percent provides a relatively flat surface while maintaining adequate drainage.

Source: 2021 IBC

1010.1.7 Door Arrangement



Two doors in series



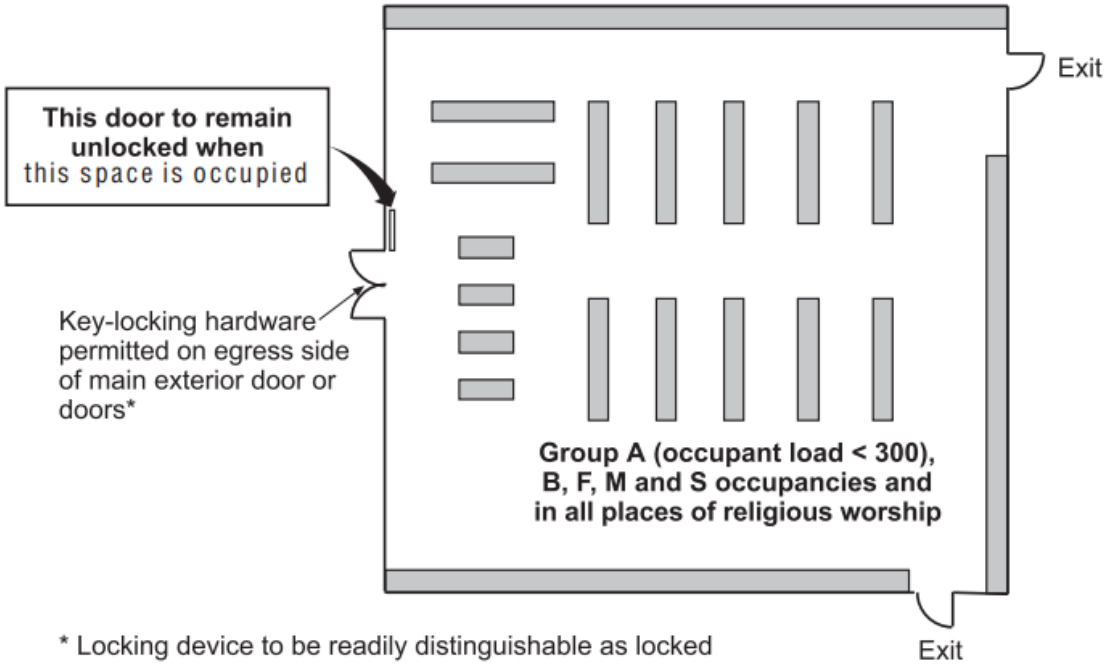
Threshold height

For SI: 1 inch = 25.4 mm.

It is also important that a threshold at a door does not overly restrict safe and efficient passage through the doorway. Where a bevel of 1:2 or less is provided, the maximum threshold height is $^1/_2$ inch. Otherwise, an abrupt change in elevation is limited to $^1/_4$ inch.

Source: 2021 IBC

1010.2 Operations



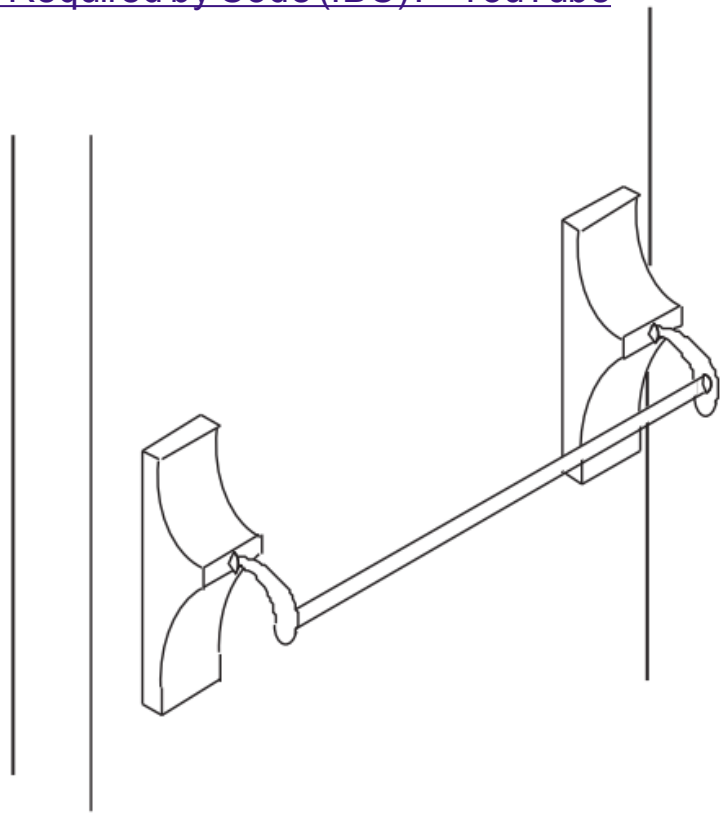
Section 1010.2.4, Exc. 3

A major exception to the lock/latch provisions applies to Groups B, F, M and S occupancies, as well as to places of religious worship and smaller assembly uses. Key-operated locking devices from the egress side of doors are permitted under limited conditions, based on compensating safeguards.

Source: 2021 IBC

1010.2.9 Panic and Fire Exit Hardware

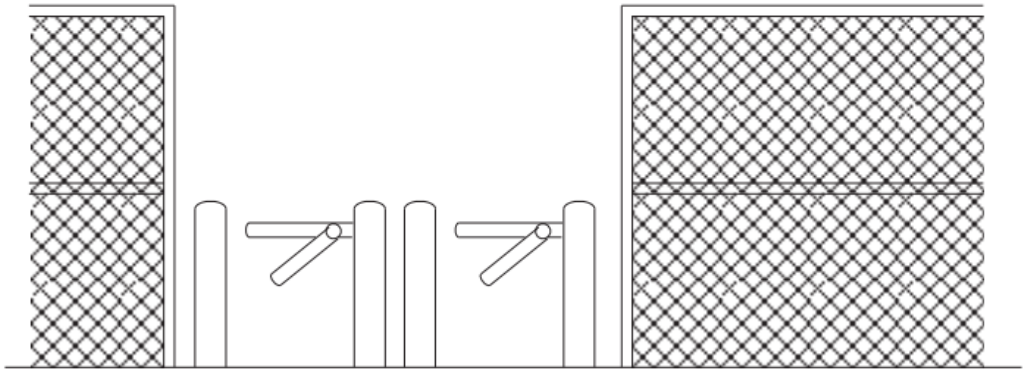
AC 017 - Egress: Where is Panic Hardware or Fire Exit Hardware Required by Code (IBC)? - YouTube



To ensure that contact with the door actuates the releasing device, the code requires that the actuating portion extend for at least one half of the door width. Where balanced or pivoted doors are used, the device width is again limited to one-half of the door width for leverage purposes.

Source: 2021 IBC

1010.5 Turnstiles



Each turnstile credited for up to 50-person capacity for egress where each turnstile:

- Will turn freely in direction of egress when power is lost, and upon manual release by employee in area
- Only given credit for 50% of required egress capacity (egress other than by turnstiles required)
- Limited to 39 inches in height
- Has minimum of $16^{1}/_{2}$ inches clear width at and below height of 39 inches
- Has minimum of 22 inches clear width at height above 39 inches

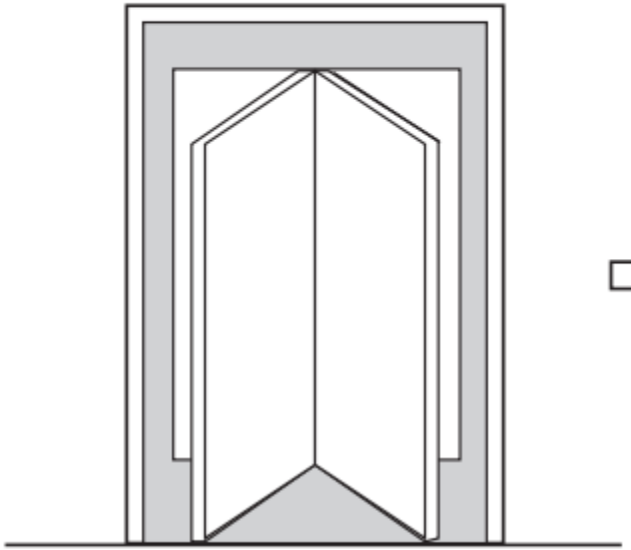
---

Where the turnstile has a height exceeding 39 inches, the restriction to egress is much like that of a revolving door, and the provisions in Section 1010.3.1 apply to this higher type of turnstile. Compliance as a security access turnstile is also permitted.

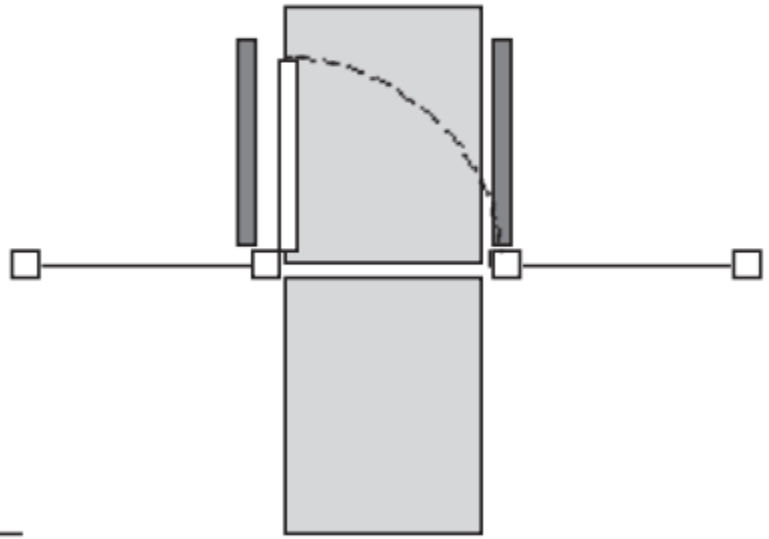
Source: 2021 IBC

1010.3 Special Doors

Revolving door



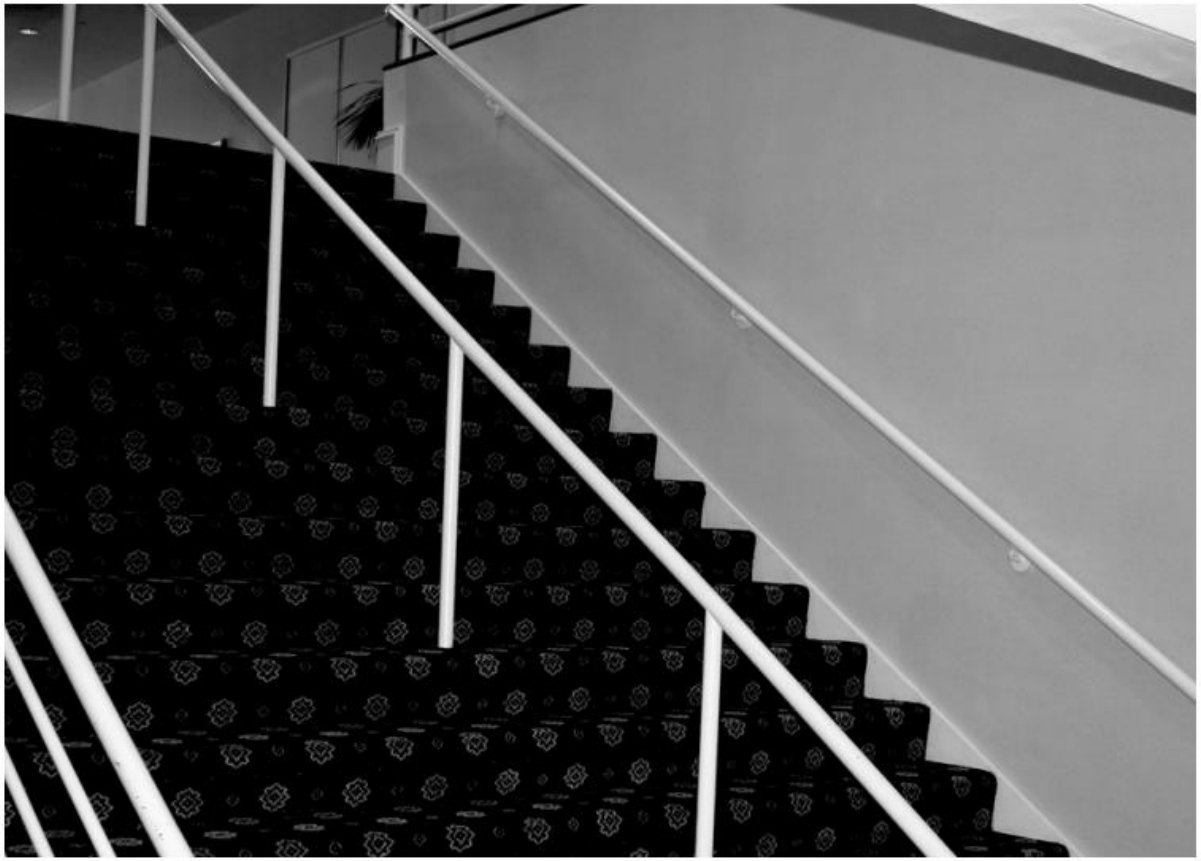
Power-operated door



The various types of special doors are permitted to be used for egress purposes when regulated by occupancy, occupant load, operation, opening force, power supply or other factors that contribute to the effectiveness and reliability of the egress door.

Source: 2021 IBC

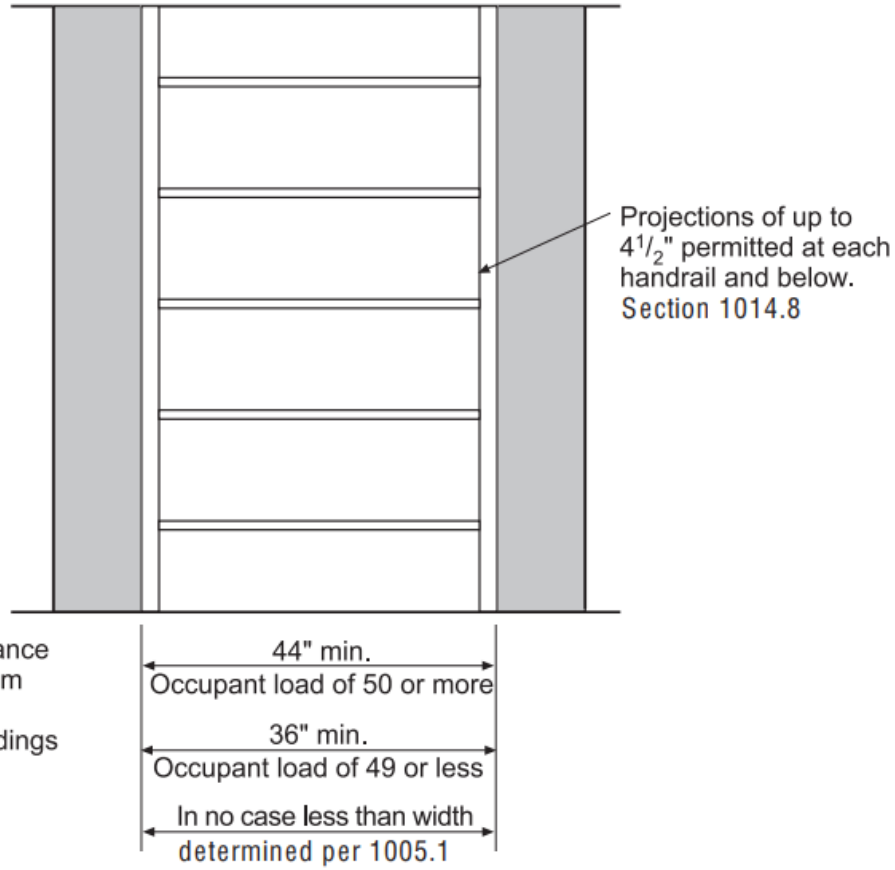
1011.1 General Provision Stairways



The provisions of Section 1011 regulating the design and construction of stairways are applicable to all stairways, including those that may be considered only “convenience” stairs and not considered a portion of any required means of egress.

Source: 2021 IBC

1011.2, 1014.8 Stairways Width

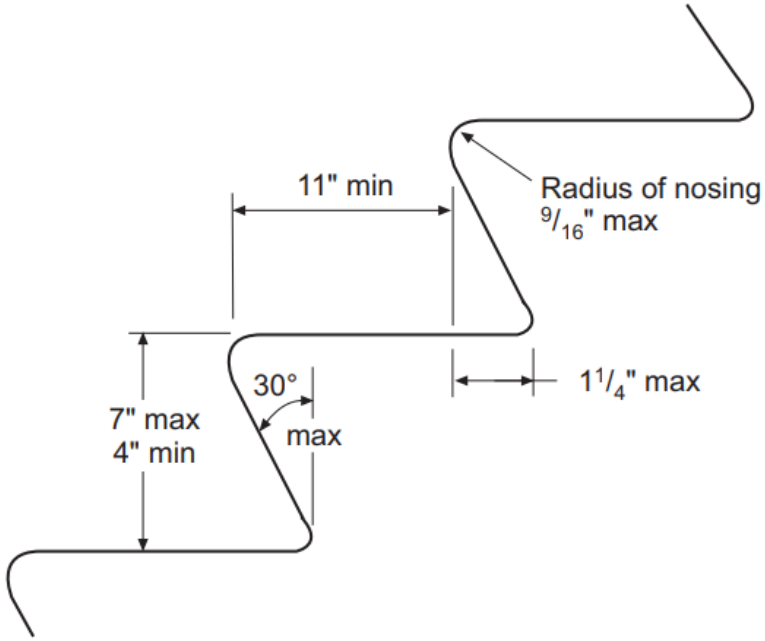


For SI: 1 inch = 25.4 mm.

Stringers, trim and similar decorative features may project a limited amount into the required stairway width unless located above the handrail. Between the rail and the required headroom height of 80 inches, no projection into the required width is permitted.

Source: 2021 IBC

1011.5 Stair Treads and Risers



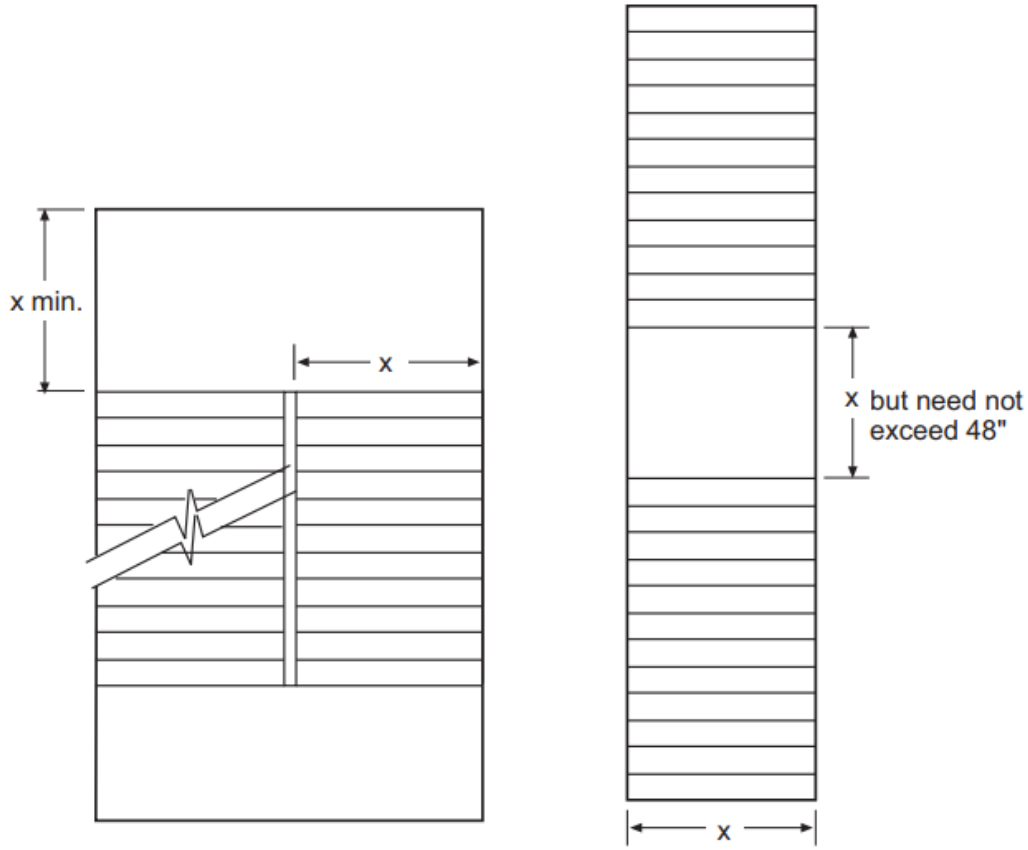
Treads and risers to be of uniform size and shape
(3/8" tolerance permitted between least and greatest within flight)

For SI: 1 inch = 25.4 mm, 1 degree = 0.01745 rad.

Curved stairways, winders, spiral stairways, aisle stairs and alternating tread devices are unique configurations requiring special consideration. The use of these stairways is limited to varying degrees based on occupancy, occupant load, design and use as a required means of egress.

Source: 2021 IBC

1011.6 Stairway Landing

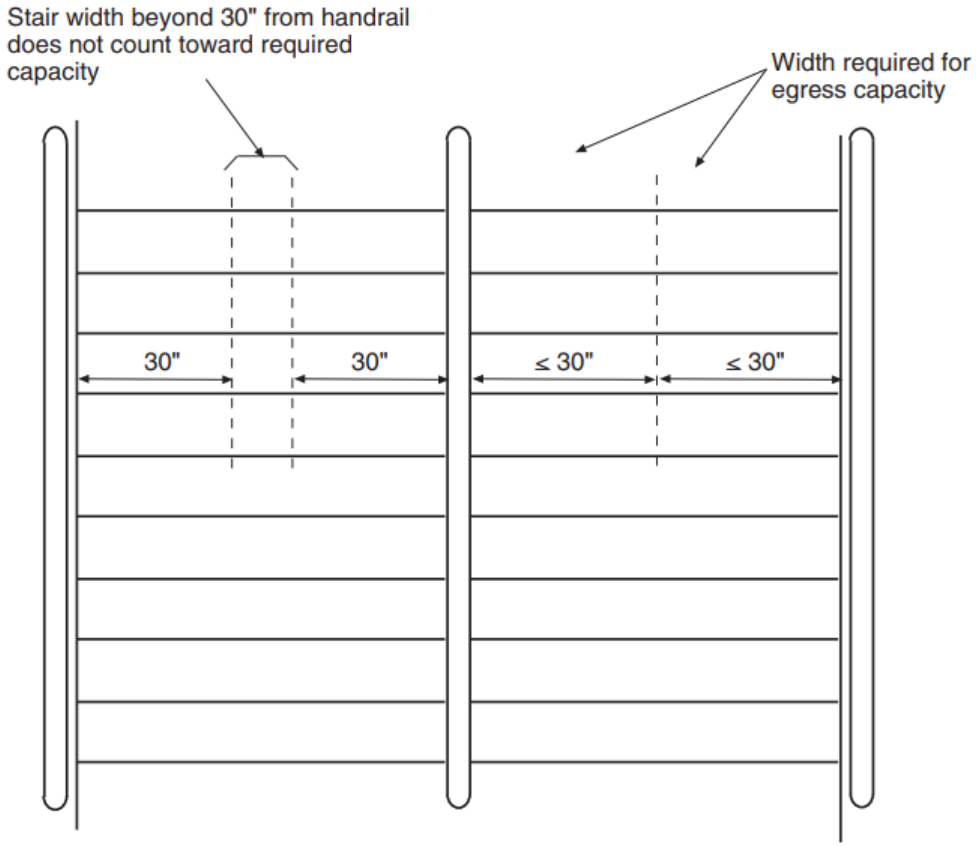


For SI: 1 inch = 25.4 mm.

Because of the difficulty many individuals encounter while negotiating stairs, the code requires a maximum vertical rise between landings of 12 feet. When placed at limited intervals, landings can be used as a resting place for the stair user and can also make stair travel less intimidating.

Source: 2021 IBC

1011.11, 1014.9 Handrail Locations

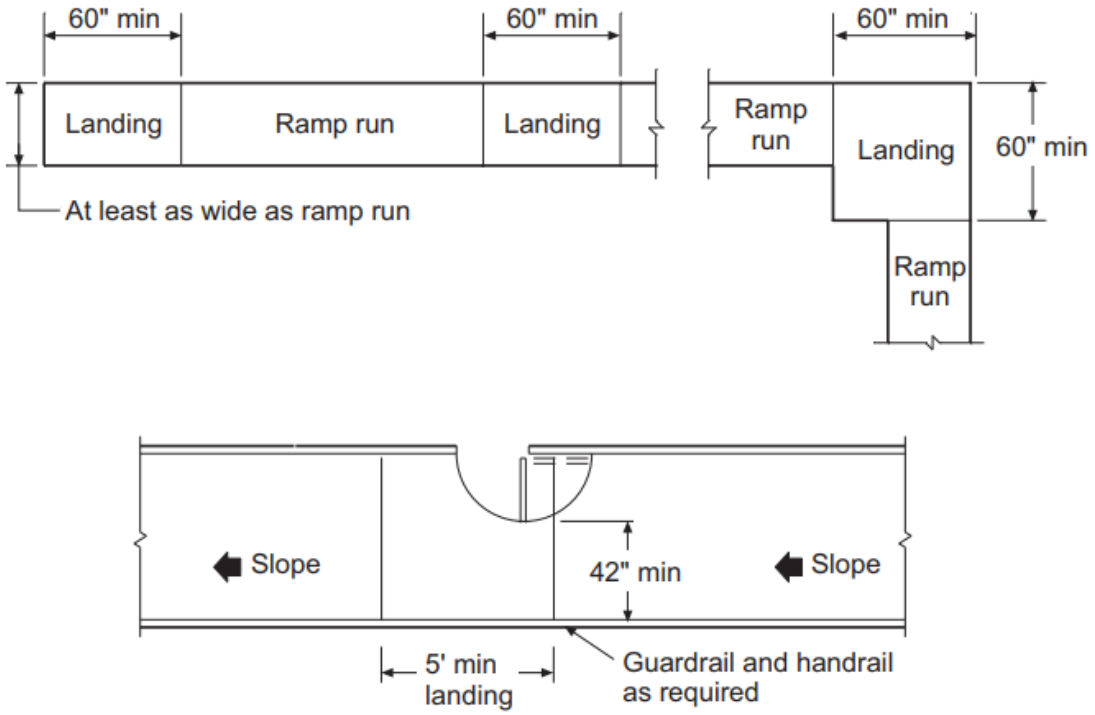


For SI: 1 inch = 25.4 mm.

Various exceptions permit the use of a single handrail, and in some cases no rail, within a dwelling unit. In addition, and applicable to all occupancies, handrails are not required for decks, patios and walkways at any single elevation change where complying landings are provided on each side.

Source: 2021 IBC

1012 Slope, Rise, Width and Handrails

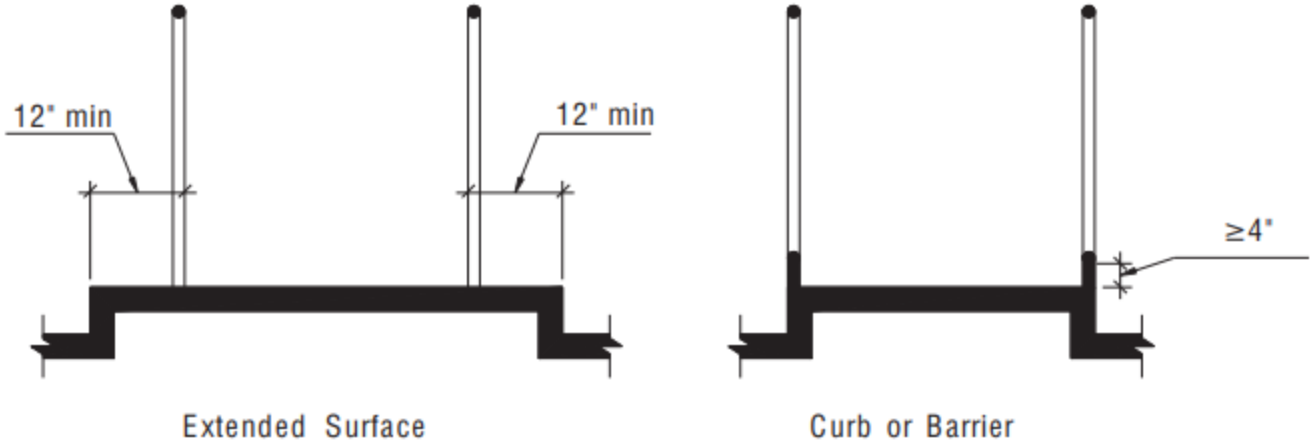


For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

To provide adequate clearance at ramp landings, doors cannot reduce the clear landing width to less than 42 inches. A landing must be at least 60 inches in length and at least as wide as the widest ramp run adjoining the landing.

Source: 2021 IBC

1012.19 Edge Protection



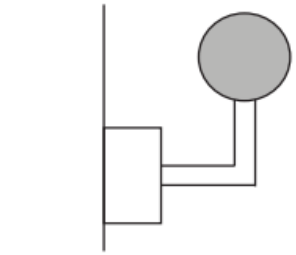
For SI: 1 inch = 25.4 mm

Edge protection is different than that type of protection provided by a guard. The presence of a complying guard does not necessarily provide adequate edge protection, and the presence of adequate edge protection does not typically satisfy the requirements for a guard.

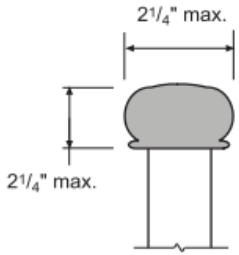
Source: 2021 IBC

1014.2, 1014.3 Handrail Dimensions

Geeking Out on Building Codes | Handrails - YouTube

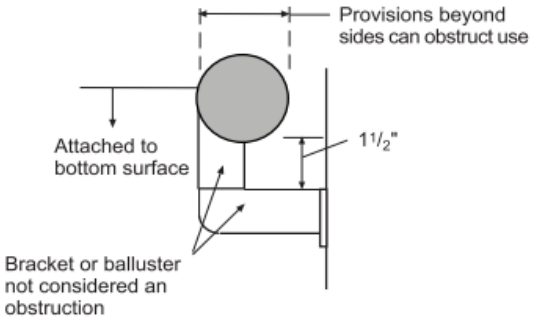


HANDRAIL with circular cross section: $1^1/_4$" min., 2" max. diameter or provide equivalent graspability

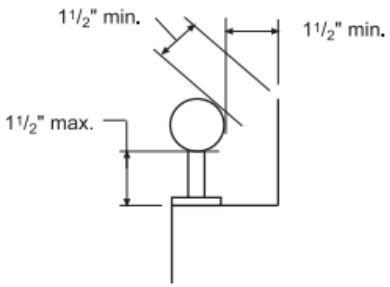


HANDRAIL that is not circular: perimeter of at least 4" but not greater than $6^1/_4$"

TYPE I HANDRAILS



Section 1014.4



Section 1014.7

For SI: 1 inch = 25.4 mm.

A major goal of handrail design and location is to make it easily graspable; hence, it is mandatory that the rail be placed at least $1^1/_2$ inches from any abutting elements, such as a wall. However, the projection of the rail into the required width is limited to no more than $4^1/_2$ inches.

Source: 2021 IBC

Class 11:
Chapter 10, Sections 1006, 1007 and through 1016 and 1021

Source: 2021 IBC

Objective

- To obtain an understanding of the system design requirements for the exit access, including number of exits, separation of egress doorways and maximum travel distances, as well as the requirements for the exit access components, including aisles, corridors and egress balconies.

Source: 2021 IBC

1006.2.1 Occupant Load and Common Path

https://www.youtube.com/watch?v=_WhcoLsLnyk

- Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the values listed in Table 1006.2.1.
- A common path of egress travel is defined as that portion of the exit access travel distance measured from the most remote point within a story to that point where the occupants have separate access to two exits or exit access doorways. The concept of limiting the common path of egress travel addresses the concern that multiple egress options must be available to occupants where the expected egress travel distance becomes excessive. Although the overall travel distance in a building may be of considerable length, such travel is greatly limited where only one egress path is available. An additional limitation due to occupant load is also applied to single exit availability.

Source: 2021 IBC

1006.2.1 Occupant Load and Common Path

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.
NP = Not Permitted.

a. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.

b. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes having *fixed seating*, see Section 1029.8.

d. For the travel distance limitations in Group I-2, see Section 407.4.

e. The *common path of egress travel* distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.

f. The length of *common path of egress travel* distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

Two basic criteria establish the point at which it is necessary to provide at least two paths of egress travel from a portion of a building. Both the maximum occupant load and the maximum common path must not be exceeded in spaces having only one exit or exit access doorway.

Source: 2021 IBC

1006.3.2 Based on Occupant Load

- Each story and occupied roof shall have the minimum number of separate and distinct exits, or access to exits, as specified in Table 1006.3.3. A single exit or access to a single exit shall be permitted in accordance with Section 1006.3.3. See the five conditions where a single exit or access to a single exit is permitted.
- Although two exits per story is an acceptable minimum for most buildings, those stories with larger occupant loads (greater than 500) must be provided with at least three exits. Four exits are mandated where the occupant load exceeds 1,000. Under no circumstances does the IBC require more than four exits from any story based upon the number of persons present. It must be noted, however, that additional exits will sometimes be required to satisfy other egress requirements of Chapter 10, such as those addressing travel distance. A single exit is permitted in applications where the story is at or near grade level, provided the occupant load is low and the common path of travel is limited.

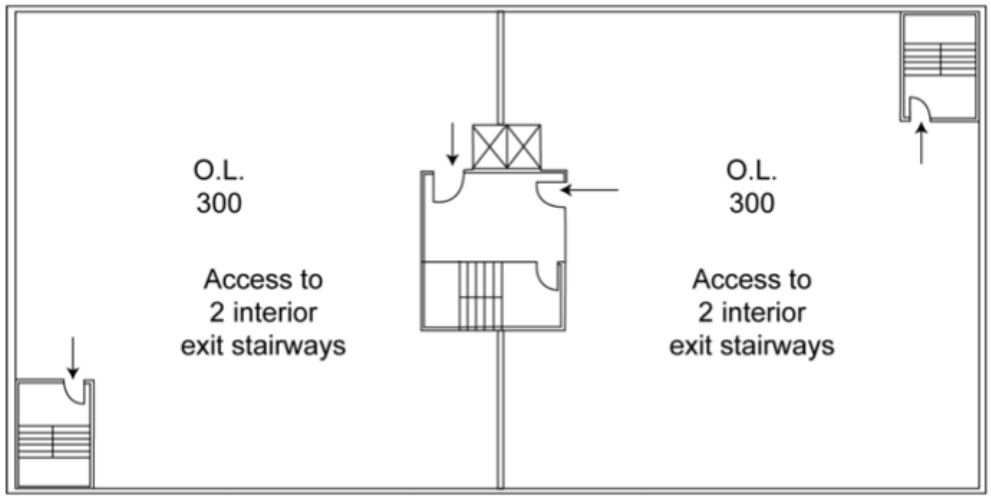
Source: 2021 IBC

1006.3.2 Based on Occupant Load

TABLE 1006.3.3
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD PER STORY	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY
1-500	2
501-1,000	3
More than 1,000	4

Total O.L. = 600
3 exits required from story



Exits from Stories

Although the use of exit access stairways is permitted to connect stories within a building, the path of egress travel to an exit is limited in a manner such that it cannot pass through more than one adjacent story. There are seven conditions under which such exit access travel to an exit through multiple stories is permitted.

Source: 2021 IBC

1006.3.4 Single Exits

- A single exit or access to a single exit shall be permitted from any story or occupied roof where one of the following conditions exists: See the five conditions that allow for a single exit.
- The general provisions call for at least two unique and separate exits from any story of a building. Buildings and stories with one exit are permitted where the configuration and occupancy meet certain characteristics that together do not present an unacceptable fire risk to the buildings' occupants. Those structures that are relatively small in size have a shorter travel distance and fewer occupants; thus, having access to a single exit does not significantly compromise the safety of the occupants.

Source: 2021 IBC

1006.3.4 Single Exits

TABLE 1006.3.4(1)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane	R-2[a, b]	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).

TABLE 1006.3.4(2)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet)
First story above or below grade plane	A, B[b], E, F[b], M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2[a, c]	10	75
	S[b, d]	29	75
Second story above grade plane	B, F, M, S[d]	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 shall have a maximum exit access travel distance of 100 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 100 feet.

Table 1006.3.4(1) is only applicable to Group R-2 occupancies containing dwelling units and allows a single exit from the basement, as well as the first, second and third stories under limited conditions. Table 1006.3.4(2) applies to all other occupancy groups and does not permit a single exit from the third story where serving such occupancies.

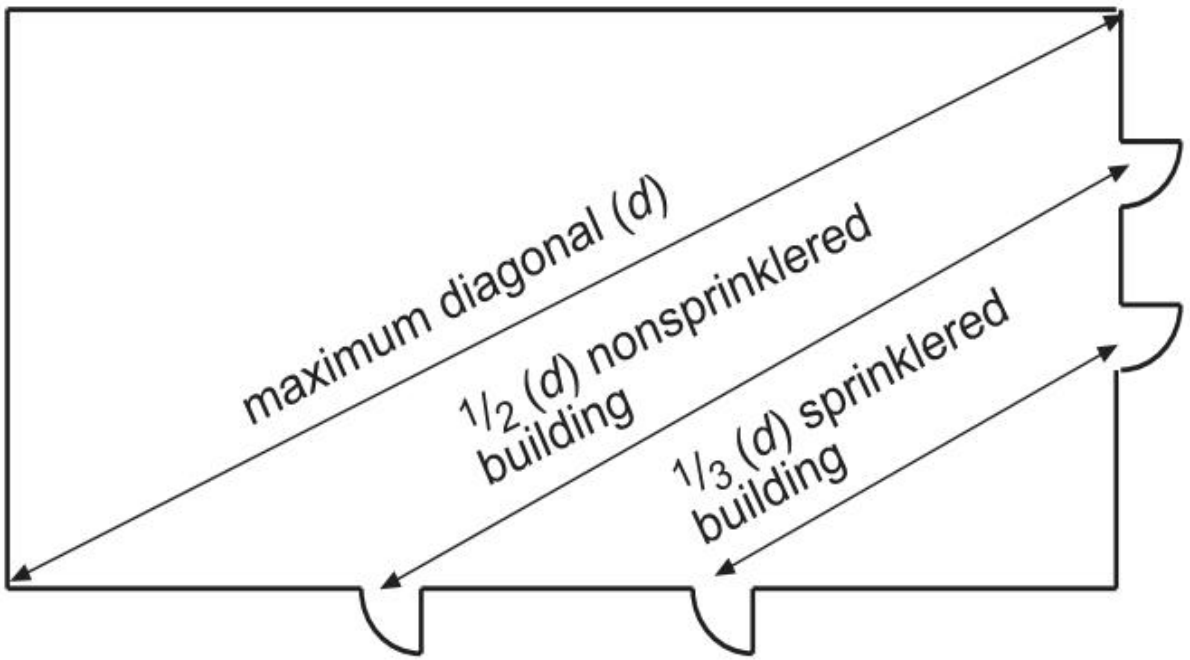
1007.1.1 Doorway Arrangement

https://www.youtube.com/watch?v=d1WA3Txpzlg

- Where two exits, exit access doorways, exit access stairways or ramps, or any combination thereof, are required from any portion of the exit access, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between them. Interlocking or scissor stairs shall be counted as one exit stairway. See the exceptions for sprinklered buildings and where a rated corridor connects two interior exit stairways.
- One of the fundamental concepts of exiting is that a single fire incident should not render all means of egress unusable. In this regard, egress doorways and exit access stairways are required to be located so as to minimize the probability of such an occurrence. The required separation in sprinklered buildings is reduced to a distance of one-third of the overall diagonal.

Source: 2021 IBC

1007.1.1 Doorway Arrangement



Where more than two exit access doorways are required, they should be situated at reasonable distances from one another so that if one doorway becomes blocked, the others will be available. The use of common sense should dictate the proper separation based on the design and use of the space or room.

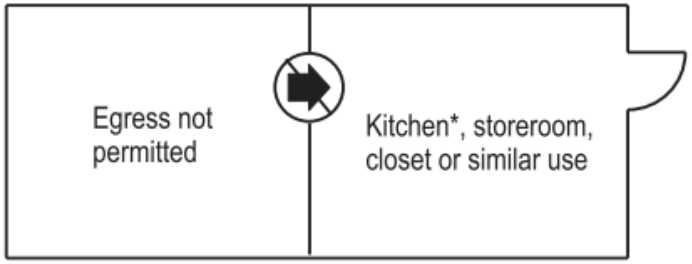
Source: 2021 IBC

1016.2, Item 2 Egress through Intervening Spaces

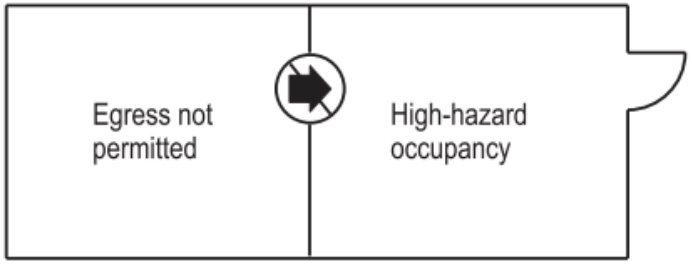
- Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas are accessory to one or the other; are not a Group H occupancy; and provide a discernible path of egress travel to an exit. See the exception for Group H, S and F occupancies.
- A workable means of egress system must be direct, obvious and unobstructed. Therefore, egress may only travel through an intervening room, space or area where the exit path is discernable. Travel must be such that it is readily apparent which direction the occupant must go to continue toward the exit. In addition, access through a high-hazard space is prohibited unless traveling from another high-hazard space. It is also expected that any intervening room used for egress will be related to the room from which egress begins.

Source: 2021 IBC

1016.2, Item 2 Egress through Intervening Spaces



* **Exception**
Kitchen within same dwelling unit or guestroom



Exception
When space to be entered is the same occupancy group

Similar to an accessible route of travel, egress is limited in that it cannot pass through kitchens, store rooms, closets or spaces used for similar purposes. These types of spaces have a high probability of blocked access and egress, due to obstructions created by the use of the space. A dedicated path created by partial or full-height walls is permitted where exiting through a stockroom serving a Group M occupancy.

Source: 2021 IBC

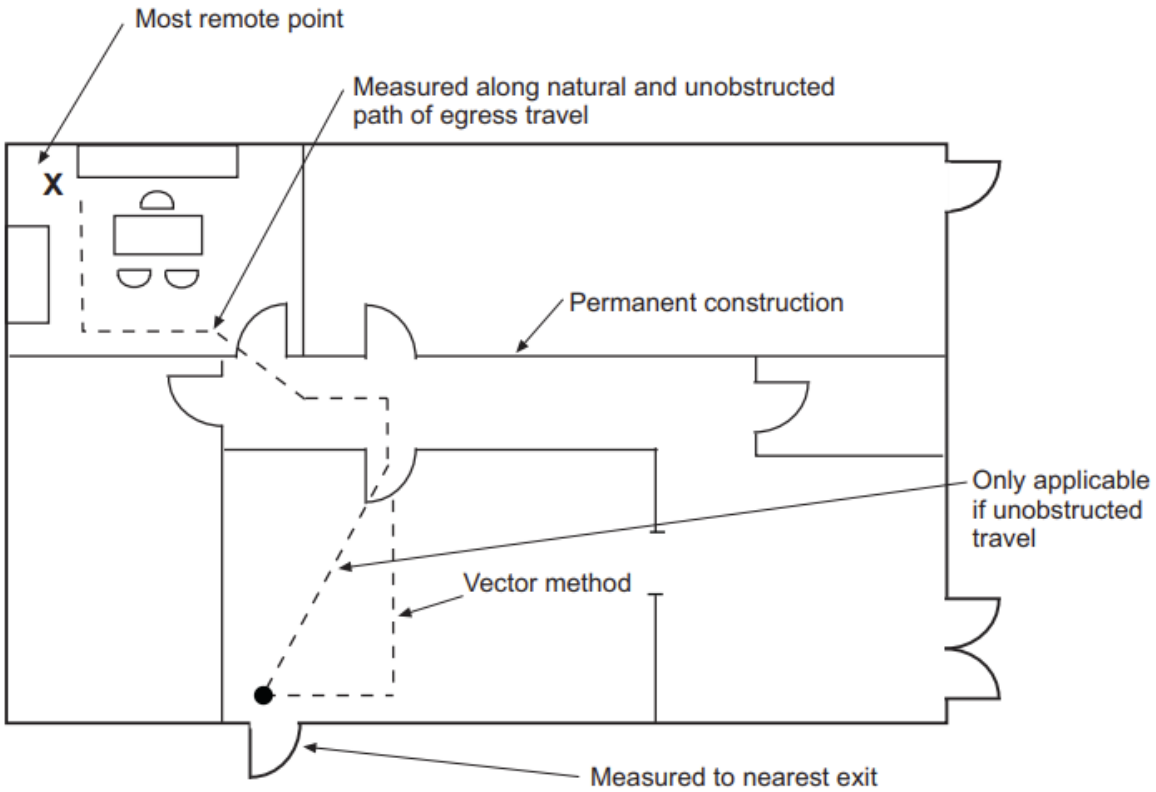
1017.2, 1017.3 Travel Distance Limitations

https://www.youtube.com/watch?v=He5PDDKiW68

- Exit access travel distance shall not exceed the values given in Table 1017.2. Exit access travel distance shall be measured from the most remote point of each room, area or space along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit. Where more than one exit is required, exit access travel distance shall be measured to the nearest exit. See the exception for open parking garages.
- Travel distance is considered the portion of egress travel between any occupiable location in a building and the nearest entrance to an exit. Because quick evacuation from a building is the foremost method of protecting the occupants in many fire incidents, the length of travel is limited until the occupant reaches one of the "protected components." Travel should be measured around any obstruction that is considered fixed or permanent, including low-height office partitions, retail shelving, storage racks, fixed seating, etc.

Source: 2021 IBC

1017.2, 1017.3 Travel Distance Limitations



In most sprinklered buildings, the code permits a moderate increase in the permitted travel distance over that permitted in nonsprinklered buildings. An increase of 50 feet is typical of most occupancies; however, a travel distance increase of 100 feet is permitted for Group B occupancies protected by a sprinkler system.

Source: 2021 IBC

1017.3.1 Travel on Exit Access Stairways

https://www.youtube.com/watch?v=1F6L3OSmxts

- Travel distance on exit access stairways or ramps shall be included in the exit access travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings.
- Travel distance may include travel on an exit access stairway or ramp. In such cases, travel up or down the stairway or ramp would need to be included in the travel distance determination. Exit access stairways are addressed under the provisions of Section 1019.

Source: 2021 IBC

1017.2, 1017.3 Travel Distance Limitations

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200[c]	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]
H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3	Not Permitted	200[c]
I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to *exit access* travel distance requirements:
Section 402.8: For the distance limitation in malls.
Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.2: For the distance limitation in special amusement areas.
Section 412.6: For the distance limitations in aircraft manufacturing facilities.
Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
Section 1006.3.4: For buildings with one exit.
Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
Section 1030.7: For increased limitation in assembly seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways.

b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

d. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.1.

e. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

As an example, where an exit access stairway is provided as a sole means of egress from a mezzanine, the travel distance would be measured from the most remote point on the mezzanine, down the stairway and continue until reaching the entrance to the nearest exit.

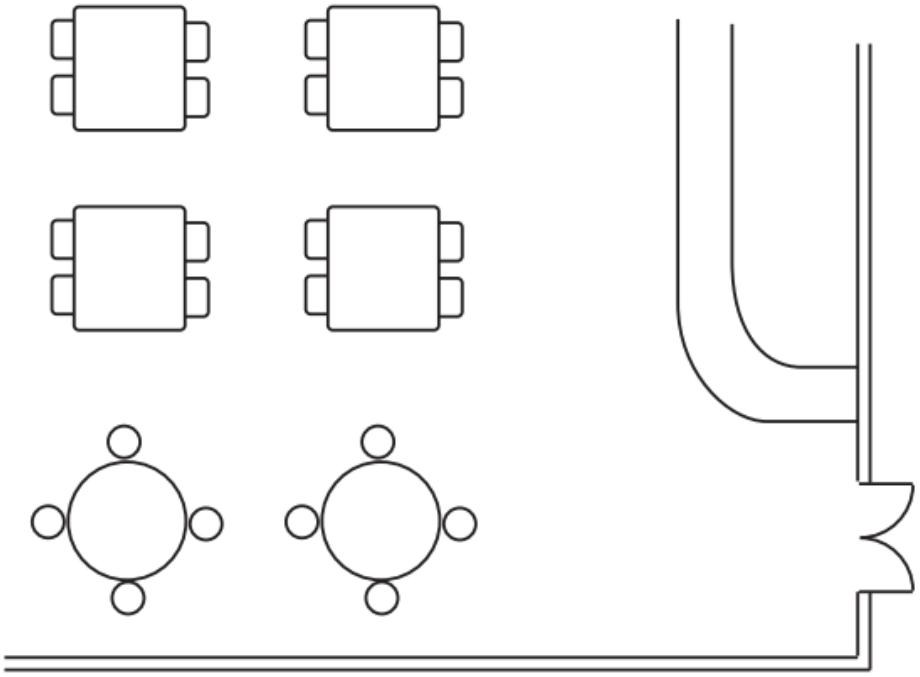
Source: 2021 IBC

1018.1 Aisles

- Aisles or aisle accessways shall be provided from all occupied portions of the exit access that contain seats, tables, furnishings, displays and similar fixtures or equipment. The minimum width or required capacity of aisles shall be unobstructed. See the exception for permissible encroachments. Aisles and aisle accessways serving a room or space used for assembly purposes shall comply with Section 1030. In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than that required for corridors by Section 1020.3. See the exception for nonpublic aisles.
- Well-defined aisles must be provided throughout office spaces, retail stores and similar facilities. The mandated clear width varies based on the presence of obstructions, such as chairs, clothes racks or other items that can easily interrupt the egress flow to an exit.

Source: 2021 IBC

1018.1 Aisles



At least 28 inches of egress width are required for nonpublic aisles not required to be accessible, provided they serve less than 50 persons.

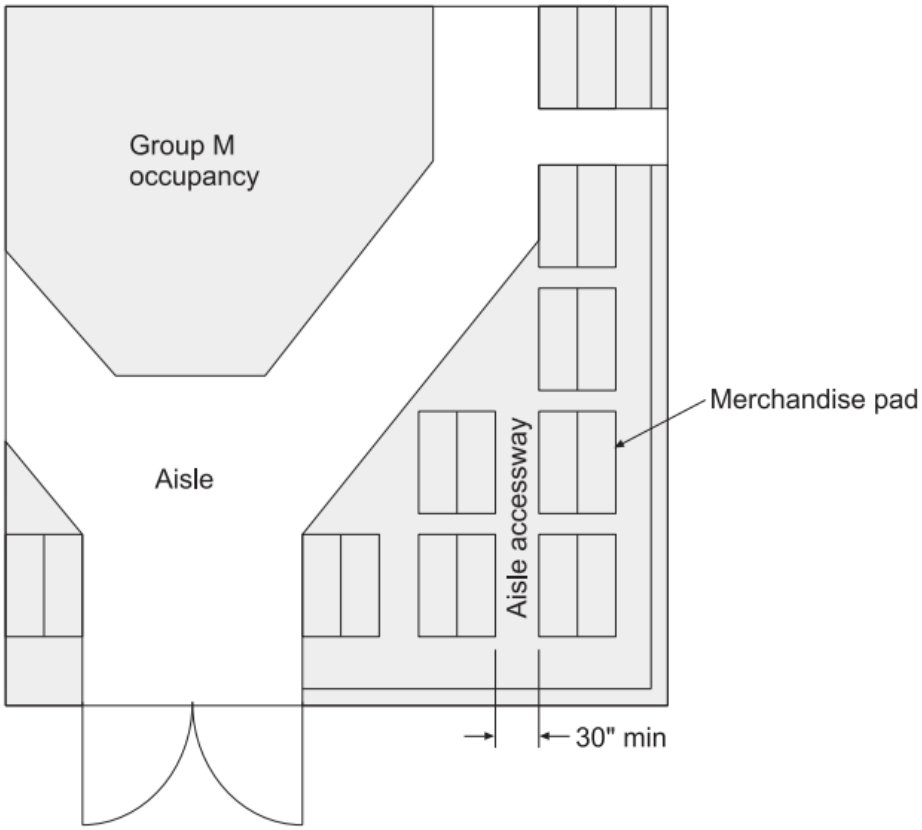
Source: 2021 IBC

1018.4 Aisles Accessway in Group M

- An aisle accessway shall be provided on not less than one side of each element within the merchandise pad. The minimum clear width for an aisle accessway not required to be accessible shall be 30 inches (762 mm). The required clear width of the aisle accessway shall be measured perpendicular to the elements and merchandise within the merchandise pad. The 30-inch (762mm) minimum clear width shall be maintained to provide a path to an adjacent aisle or aisle accessway.
- A merchandise pad is defined as the merchandise display area that contains multiple counters, shelves, racks and other movable fixtures. Bounded by aisles, permanent fixtures and walls, the merchandise pad also includes aisle accessways utilized to provide both access to an aisle and circulation throughout the pad area.

Source: 2021 IBC

1018.4 Aisles Accessway in Group M



For SI: 1 inch = 25.4 mm

Within a merchandise pad, the common path of travel is limited to 75 feet in length. Where the occupant load of the area served by the common path exceeds 50 persons, the common path cannot exceed 30 feet in length from any point in the merchandise pad.

Source: 2021 IBC

1020.1 Corridor Construction

Corridor Inspection - YouTube

- Corridors shall be fire-resistance rated in accordance with Table 1020.2. The corridor walls required to be fire-resistance rated shall comply with Section 708 for fire partitions. See the five exceptions where a rating is not required.
- A fire-resistance-rated corridor is intended to protect occupants of the corridor during egress travel from an incident in an enclosed space bordering the corridor. The construction of the corridor provides a minimum level of protection from fire and smoke through the use of fire-resistance-rated walls and ceilings, as well as fire-protected openings. Smoke infiltration is limited also by smoke- and draft-control door assemblies and smoke dampers. Occupancy group, occupant load and presence of a fire sprinkler system are the major factors in determining whether or not a corridor must have a fire-resistance rating.

Source: 2021 IBC

1020.1 Corridor Construction

TABLE 1020.2
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system
H-1, H-2, H-3	All	Not Permitted	1[c]
H-4, H-5	Greater than 30	Not Permitted	1[c]
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5[c]/1[d]
I-2[a]	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b, c]
I-4	All	1	0

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.
d. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

Exceptions eliminate the need for a fire-resistance-rated corridor in certain Group E occupancies, in sleeping units or dwelling units of residential occupancies, in open parking garages and in Group B occupancies that are permitted a single means of egress by Section 1006.2.

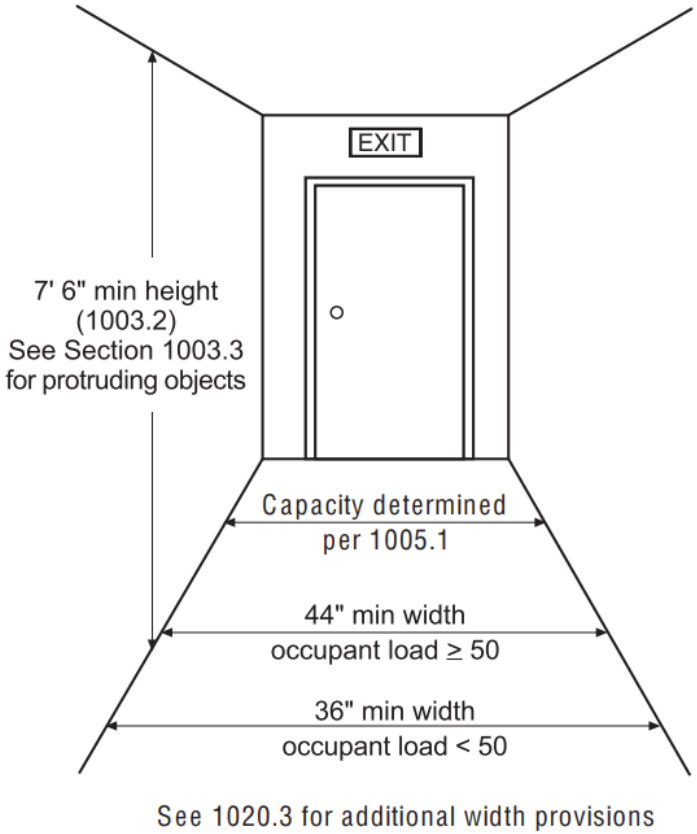
Source: 2021 IBC

1020.3 Corridors: Width and Capacity

- The required capacity of corridors shall be determined as specified in Section 1005.1, but the minimum width shall be not less than that specified in Table 1020.3. Table 1020.3 identifies a minimum required width of 44 inches except for: (1) 24 inches for access to building systems or equipment, (2) 36 inches for occupant loads less than 50, (3) 36 inches within a dwelling unit, (4) 72 inches for a Group E corridor with an occupant load of 100 or more, (5) 72 inches in specified areas of ambulatory care facilities, and (6) 96 inches in Group I-2 areas where required for bed movement.
- To allow for adequate circulation throughout a building and, more importantly, for egress purposes, a minimum width requirement is established. In addition, complying routes of travel to accessible spaces must be provided. Only in areas used for access to electrical, mechanical or plumbing systems or equipment is the width permitted to be reduced to less than 36 inches. A minimum 36-inch width is mandated for corridors within dwelling units, or for those corridors serving an occupant load of 50 or less. Only specific projections such as doors are permitted to encroach a limited distance into the required corridor width.

Source: 2021 IBC

1020.3 Corridors: Width and Capacity



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Certain occupancies require additional corridor widths based on their specialized uses. Corridors serving 100 or more occupants in Group E educational occupancies must be at least 72 inches in width, and healthcare occupancies require increased widths for bed movement.

Source: 2021 IBC

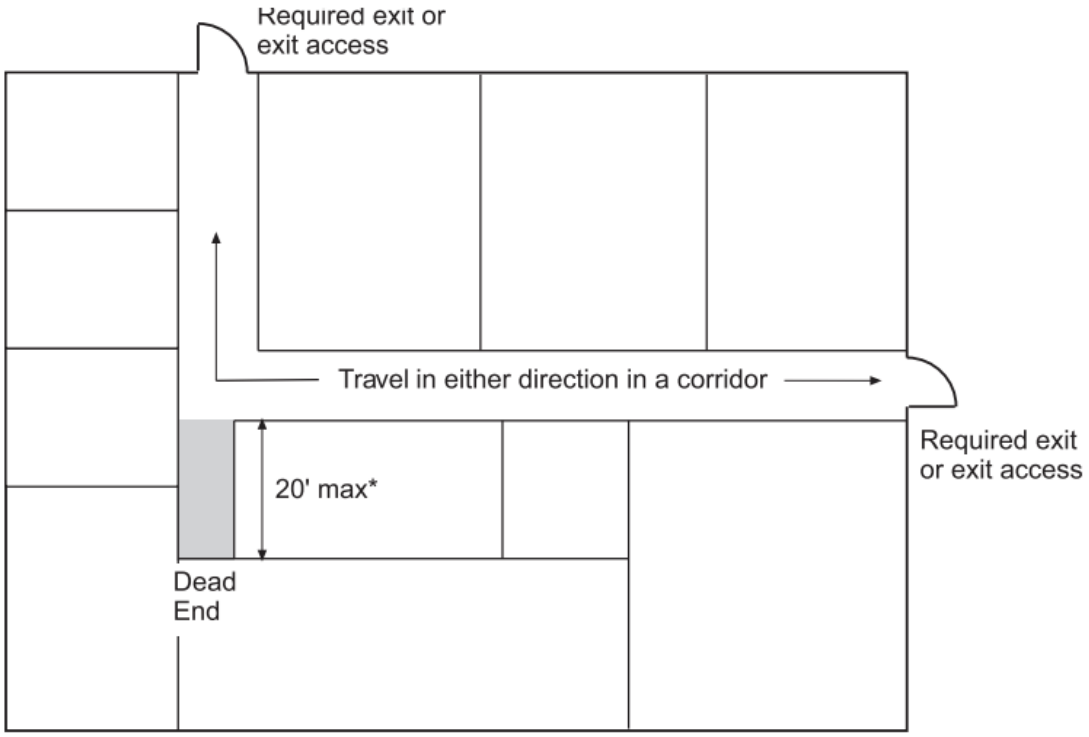
1020.3 Corridors: Means of Egress

https://www.youtube.com/watch?v=Oka90IqjF7I&t=27s

- Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length. See the four exceptions for increased dead-end lengths.
- Limitations on dead-end corridors are established where two or more exit or exit access doorways are required. The intent is to limit the distance building occupants must travel before they determine that there is no way out and that they must retrace steps in order to locate an exit or exit access doorway. Where only a single means of egress is permitted, a dead-end condition is not limited in length; however, the provisions of Section 1006.2.1 for common paths of travel must be considered

Source: 2021 IBC

1020.3 Corridors: Means of Egress



* 50 ft max in sprinklered Group B, E, F, I-1, M, R-1, R-2, R-4, 5 and U occupancies
* Up to 2.5 times the least corridor width
* 50 ft max in I-3 Conditions 2, 3 or 4
*30 ft max in Group I-2, Condition 2 corridors that do not serve patient rooms or treatment spaces

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Once a building occupant enters a corridor during emergency egress conditions, there is an expectation that a direct and obvious exit path is available. Dead-end configurations should be minimal, if not eliminated, to expedite the exiting process.

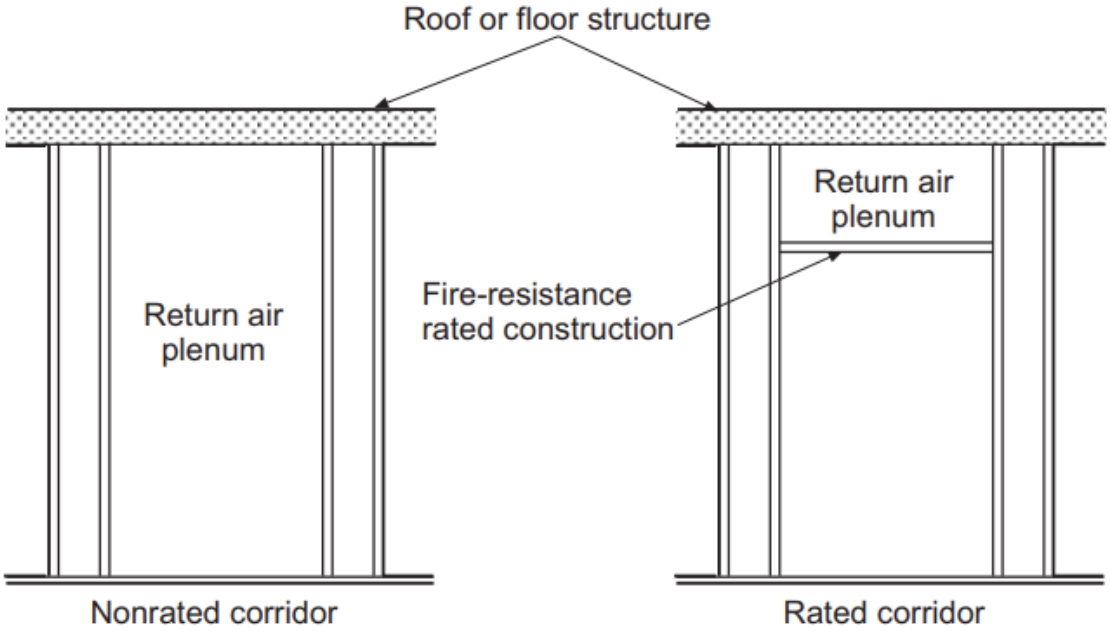
Source: 2021 IBC

1020.6, 1020.6.1 Air Movement in Corridors: Means of Egress

- Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts or plenums. See the four exceptions addressing return air, make-up air and incidental air movement. Use of the space between the corridor ceiling and the floor or roof structure above as a return air plenum is permitted for one or more of the following conditions: See the five conditions.
- The use of corridors for the movement of air is strictly limited by the code. Because a corridor is intended to be a relatively safe environment for occupants exiting a building, it is not advisable to introduce air movement that might increase the potential for fire, smoke or toxic gases to enter the corridor. It is possible, under specific conditions, to use the space above a corridor ceiling as a return air plenum. For example, where the corridor is not required to be of fire-resistance-rated construction, or where the above-ceiling space is isolated from a rated corridor by fire-resistance-rated construction, the upper area may be used for return air.

Source: 2021 IBC

1020.6, 1020.6.1 Air Movement in Corridors: Means of Egress



Where a corridor is directly supplied with outdoor air, make-up air for exhaust systems in rooms that open directly into a corridor may be taken from the corridor. The rate at which outdoor air is supplied to the corridor must exceed the rate of makeup air taken from the corridor.

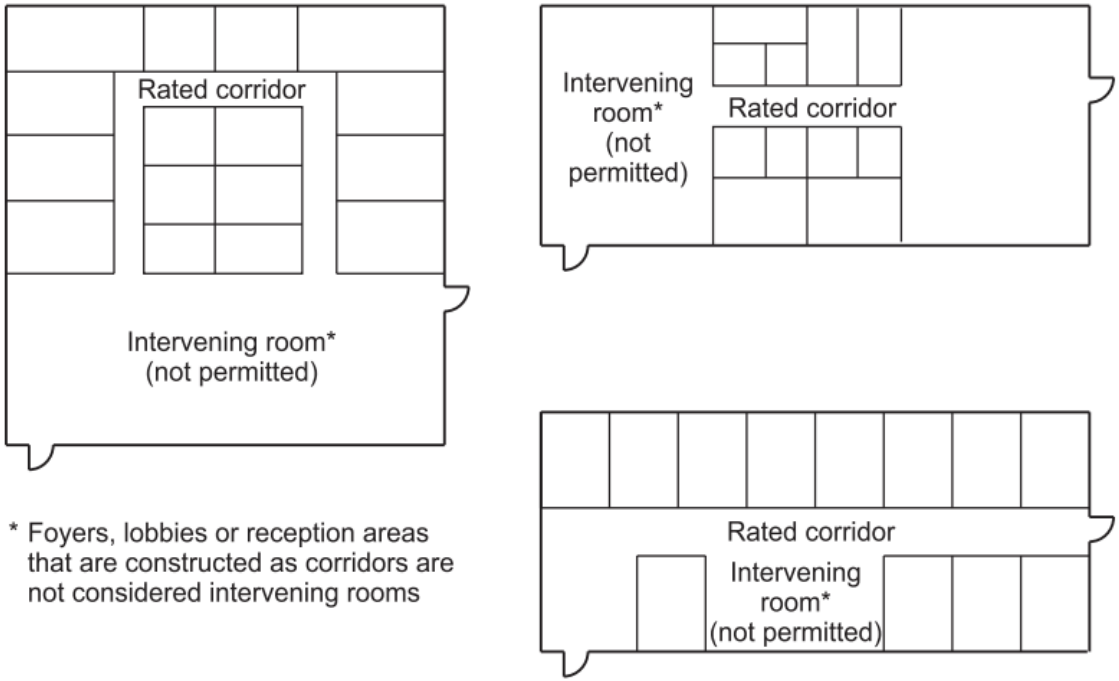
Source: 2021 IBC

1020.7 Corridors Continuity

- Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms. See the exceptions for travel through foyers, lobbies and reception rooms, as well as through enclosed elevator lobbies.
- Once an occupant enters a corridor required to be of fire-resistance-rated construction, he or she expects that travel to an exit will be direct. The level of protection within the corridor must not be reduced at any point along the egress path. Where an intervening room or space interrupts the corridor, it is quite likely that the exitway will be obstructed or confusing. Where corridor travel includes or terminates at a lobby, foyer or reception room, the condition is considered acceptable, insofar as such spaces are usually an extension of the circulation and egress path.

Source: 2021 IBC

1020.7 Corridors Continuity



* Foyers, lobbies or reception areas that are constructed as corridors are not considered intervening rooms

Where the path of travel occurs in a corridor not required to be fire-resistance-rated, such travel may then proceed through other intervening spaces, provided all other requirements of the code are met, such as those for common path of egress travel and travel distance.

Source: 2021 IBC

Topic: Egress Balconies	**Category:** Means of Egress
Reference: IBC 1021	**Subject:** Exit Access

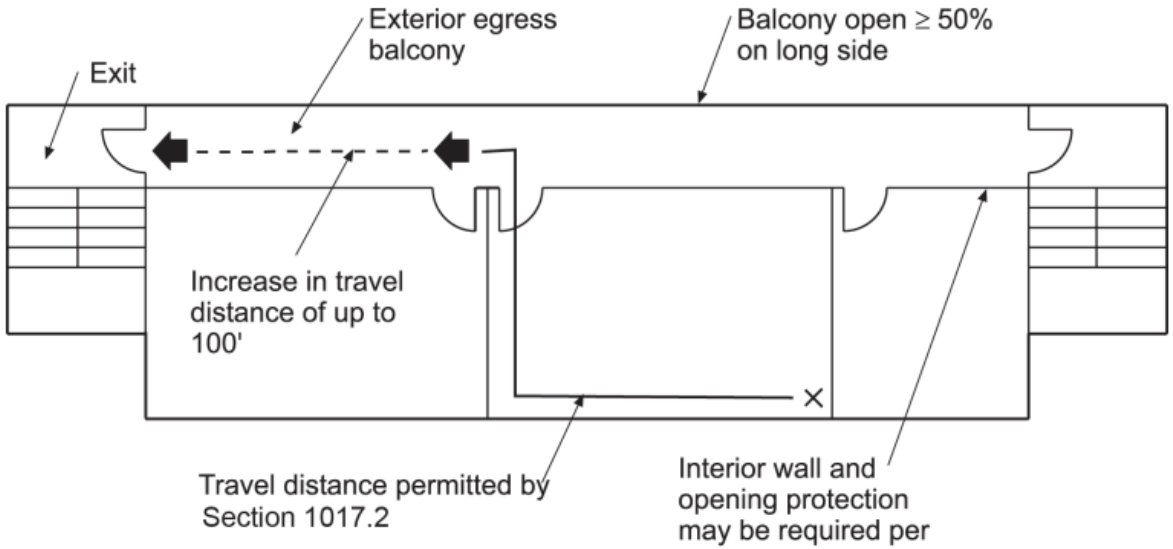
Code Text: *Balconies used for egress purposes shall conform to the same requirements as corridors for minimum width, required capacity, headroom, dead ends and projections. Exterior egress balconies shall be separated from the interior of the building by walls and opening protectives as required for corridors.* See the exception for elimination of separation.

Discussion and Commentary: Although the openness of exterior balconies provides some degree of protection from smoke and toxic gases created by a fire, travel along such balconies usually places the occupants at considerable risk. Therefore, the IBC regulates egress balcony travel in a manner consistent with unprotected travel inside the structure. An increase of 100 feet in maximum allowable travel distance is permitted by Section 1017.2.1 for egress balcony travel.

Source: 2021 IBC

Topic: Egress Balconies
Reference: IBC 1021

Category: Means of Egress
Subject: Exit Access



For SI: 1 foot = 304.8 mm

For an exit access element to be considered an egress balcony, it must be sufficiently open to the exterior to minimize the potential for smoke and toxic gases to accumulate. The code considers openings for at least 50 percent of the long side to be adequately open.

Source: 2021 IBC

2021 IBC Sections 1022 through 1031

Means of Egress IV

OBJECTIVE: To obtain an understanding of the provisions governing the exit and exit discharge portions of the means of egress, the special requirements applicable to egress from assembly occupancies, and the details for emergency escape and rescue openings.

Source: 2021 IBC

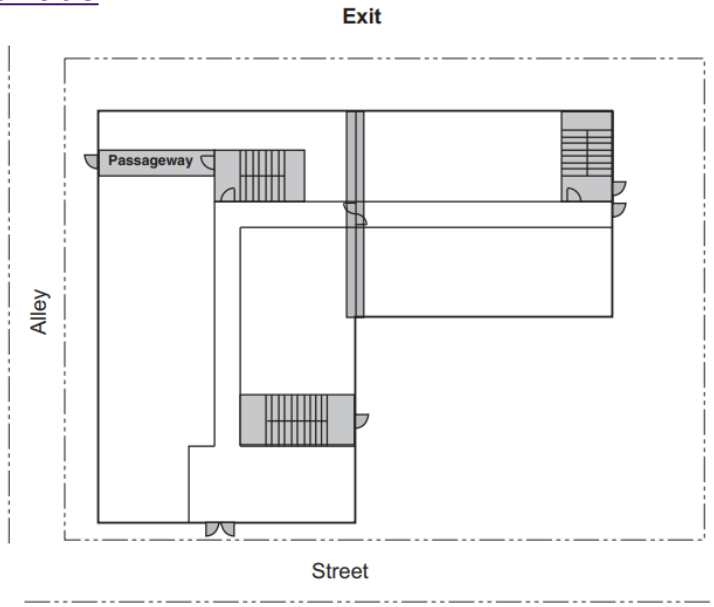
Topic: Definition
Reference: IBC 1022, 202

Category: Means of Egress
Subject: Exits

Code Text: An exit is *that portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways and ramps, exit passageways, exterior exit stairways and ramps, and horizontal exits.*

Discussion and Commentary: The path of travel through the exit access portion of the egress system must be designed to lead to one or more exits, which are locations where some degree of protection or safety from fire hazards is provided. Travel distance is no longer regulated once an exit is reached; therefore, travel within an exit component is virtually unlimited.

What is an exit? - YouTube



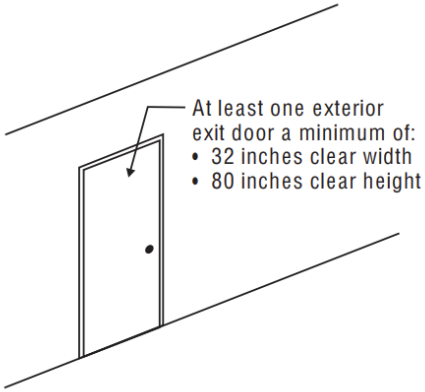
Because an exit must be maintained for egress, it cannot be used for any purpose that interferes with egress. In addition, once a mandated level of protection is provided for occupants reaching an exit, that level cannot be diminished prior to their reaching the exit discharge.

Source: 2021 IBC

Topic: General Provisions | **Category:** Means of Egress
Reference: IBC 1022.1, 1022.2 | **Subject:** Exits

Code Text: *An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge. Buildings or structures used for human occupancy shall have at least one exterior door that meets the requirements of Section 1010.1.1* (Size of doors).

Discussion and Commentary: Exits constitute those portions of the means of egress where the occupant first achieves a significant level of fire protection. An exit is expected to provide a mandated level of protection, and that level cannot be reduced until arrival at the exit discharge. The primary function of an exit component is to provide egress, and any other use cannot interfere with that function. Use of the exit for other purposes can often lead to the egress path being obstructed and possibly unusable. It is not uncommon to find the storage of equipment or furniture occurring within an exit enclosure, creating an unsafe condition.



EXTERIOR EXIT DOOR

All buildings, regardless of size, that are intended for human occupancy must have a minimum of one exit door that meets the minimum width and height requirements of Section 1010.1.1. The intent of this provision is to override any exceptions for minimum door width and height that may apply in other locations throughout the building.

Source: 2021 IBC

Topic: Construction | **Category:** Means of Egress

Reference: IBC 1023.2 | **Subject:** Interior Exit Stairways and Ramps

Code Text: *Enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. Enclosures for interior exit stairways and ramps shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.*

Discussion and Commentary: Vertical openings created for stairways must typically be enclosed with fire-resistance-rated construction. The presence of openings into and penetrations through interior exit stairways and ramps is strictly limited due to the high-level nature of the egress elements. Ventilation of an interior stairway or ramp is also highly regulated. The integrity of the means of egress system must be maintained until arrival at the exit discharge or public way.

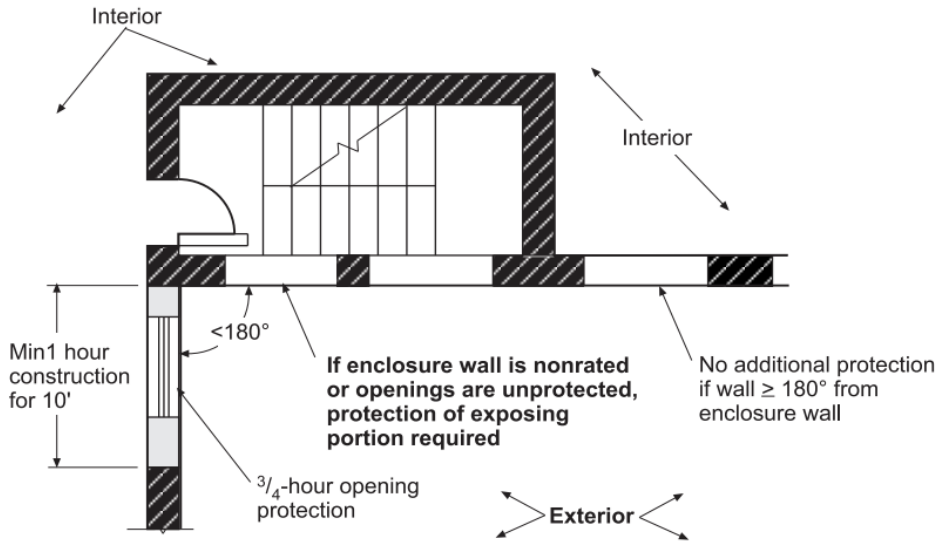
Interior exit stairways and ramps must always be enclosed with fire-resistance-rated construction. Allowances for unenclosed stairways within the means of egress are established in Section 1019 under the provisions for exit access stairways.

Source: 2021 IBC

Topic: Interior Stairway Exterior Walls | **Category:** Means of Egress
Reference: IBC 1023.7 | **Subject:** Interior Exit Stairways and Ramps

Code Text: *Where nonrated walls or unprotected openings enclose the exterior of the stairway and the walls or openings are exposed to other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $^3/_4$ hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or to the roof line, whichever is lower.*

Discussion and Commentary: Unless regulated according to fire separation distance or type of construction, the exterior wall of an interior exit stairway or ramp usually needs no fire-resistance rating. However, where exposure is possible from other exterior walls of the building in close proximity to the enclosure, a limited degree of fire separation is necessary.



For SI: 1 foot = 304.8 mm, 1 degree = 0.01745 rad.

An alternative to the protection of exterior walls adjacent to an interior exit stairway or ramp is the protection of the exterior wall of the enclosure itself. Should a fire breach an adjacent exterior wall, its penetration of the stairway or ramp enclosure would be halted for an acceptable time period.

Source: 2021 IBC

Topic: Smokeproof Enclosures | **Category:** Means of Egress

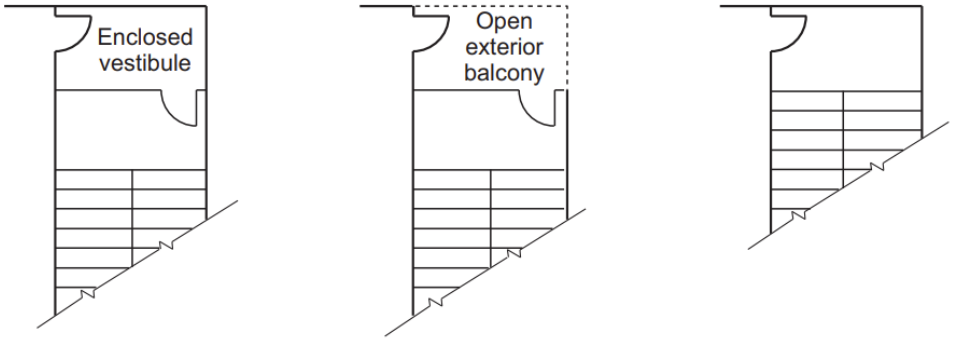
Reference: IBC 1023.12, 1023.12.2 | **Subject:** Interior Exit Stairways and Ramps

Code Text: *Where required by Section 403.5.4* (high-rise buildings), *405.7.2* (underground buildings) *or 412.2.2.1* (airport traffic control towers) *interior exit stairways and ramps shall be smokeproof enclosures in accordance with Section 909.20. Access to the stairway within a smokeproof enclosure shall be by way of a vestibule or an open exterior balcony.* See the exception for stairways using the pressurization alternative complying with Section 909.20.5.

Discussion and Commentary: In those buildings where vertical egress travel is extensive, an additional level of protection is mandated, primarily to address the hazard of smoke and toxic gases that are produced in a fire. Through ventilation or pressurization, the potential for smoke and gases to enter the enclosure is dramatically reduced.

How Mechanical Smoke Ventilation Systems Work - YouTube

Smokeproof enclosures



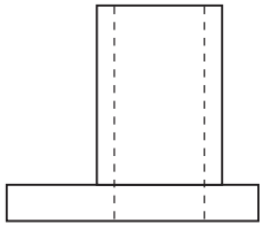
If a smokeproof enclosure does not exit directly to a yard, court or public way, then an exit passageway must be provided to extend protected travel to the exterior. The exit passageway may have no other openings unless it is protected in the same manner as the vertical enclosure.

Source: 2021 IBC

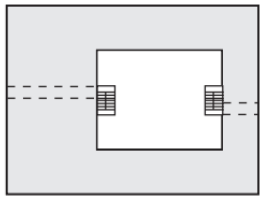
Topic: Openings and Penetrations | **Category:** Means of Egress
Reference: IBC 1023.4, 1024.5 | **Subject:** Exits

Code Text: *Except as permitted in Section 402.8.7* (exit passageways in covered mall buildings), *openings in interior exit stairways and ramps (and exit passageways) other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure (or exit passageway). Penetrations into and openings through interior exit stairways and ramps are prohibited except for:* See seven different conditions under which penetrations are acceptable.

Discussion and Commentary: Given the importance of an exit enclosure in the means of egress system, no unnecessary openings or penetrations are permitted to breach the fire-resistant separation. The provisions are essentially the same for both interior exit stairways and exit passageways.



Elevation



Plan

Enclosure construction:

- Four or more stories—2-hour fire resistance
- Less than four stories—1-hour fire resistance

Openings and penetrations:

- Permitted exterior openings (705)
- Egress from normally occupied spaces
- Egress from enclosure
- Fire protection systems
- Ductwork for independent pressurization
- Limited electrical conduit
- Security systems
- Two-way communication systems
- Structural elements supporting stairway or enclosure

Doors: (716)

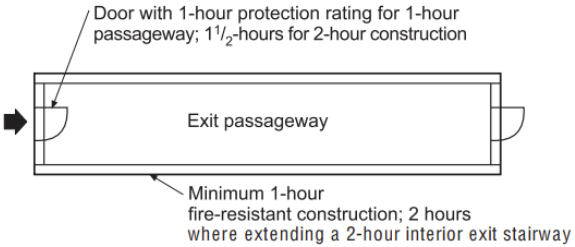
- Self-closing or automatic closing
- 1-hour rating in 1-hour construction
- $1^1/_2$-hour rating in 2-hour construction
- Temperature rise limit of 450°F above ambient

Several methods are set forth in the code to provide for ventilation of an exit enclosure. In general, penetrations for ductwork must enter directly from the building's exterior or from an interior space separated from the remainder of the building by a shaft enclosure.

Topic: Construction | **Category:** Means of Egress
Reference: IBC 1024.1, 1024.3 | **Subject:** Exit Passageways

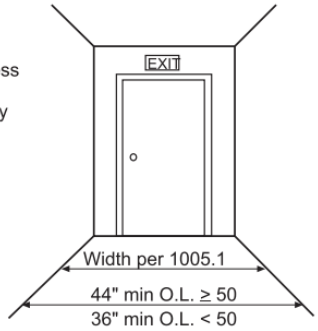
Code Text: *An exit passageway shall not be used for any purpose other than a means of egress and a circulation path. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating, and not less than that required for any connecting interior exit stairway or ramp. Exit passageways shall be constructed as fire barriers in accordance with Section 707, or horizontal assemblies constructed in accordance with Section 711, or both.*

Discussion and Commentary: An exit passageway is defined as an exit component that is separated from all other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to an exit or to the exit discharge. It is an egress component of a higher level than a fire-resistance-rated corridor, based primarily on limited openings and penetrations, and increased fire ratings.



- Openings limited to those necessary for egress
- Elevators shall not open into exit passageway
- Penetrations not permitted except for those serving the exit passageway

For SI: 1 inch = 25.4 mm.



Once in an exit passageway, the building occupant is considered to be in a relatively safe location; thus, travel distances within the exit passageway are unregulated. Simply put, an exit passageway is a horizontal exit enclosure, with conditions and limitations similar to those required for an interior exit stairway.

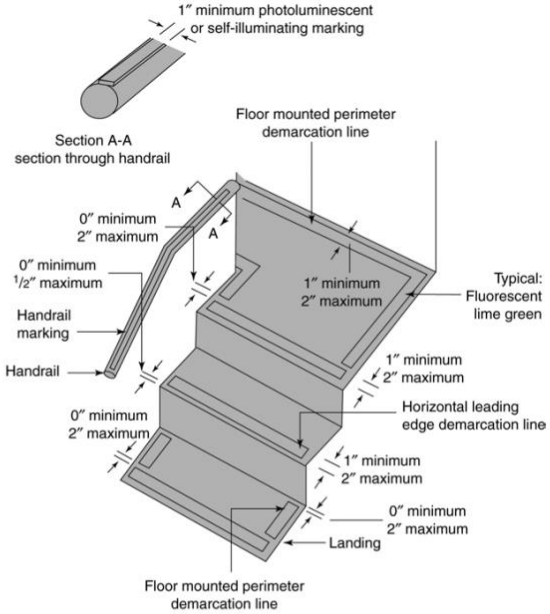
[AC 049 - Corridors Vs. Exit Passageways (with corrected audio) - YouTube]

Source: 2021 IBC

Topic: General Provisions | **Category:** Means of Egress
Reference: IBC 1025.1 | **Subject:** Luminous Egress Path Markings

Code Text: *Approved luminous egress path markings delineating the exit path shall be provided in high-rise buildings of Groups A, B, E, I-1, M and R-1 occupancies in accordance with Sections 1025.1 through 1025.5.* See the exception for lobbies on the level of exit discharge.

Discussion and Commentary: Photoluminescent or self-luminous materials are required in interior exit stairways and exit passageways of certain high-rise buildings in order to delineate the exit path. Improved safety for individuals negotiating stairs during the extended egress required in a high-rise building is provided by improving the visibility of stair treads and handrails under normal and emergency conditions.



Note: The width of demarcation lines at horizontal leading edges of stairs, perimeter demarcation line and handrails may be less than 1″ width when listed in accordance UL 1944.

Analogous to rechargeable batteries, many photoluminescent and self-illuminating egress path markings require exposure to light to perform properly. Thus, such markings must be exposed to a minimum of 1 foot-candle of light energy at the walking surface for at least 60 minutes prior to the building being occupied.

[Ecoglo Photoluminescent Safety Products - YouTube]

Source: 2021 IBC

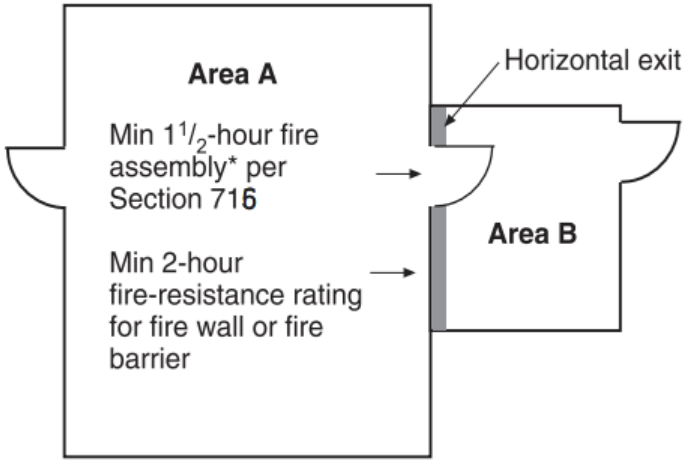
Topic: General	**Category:** Means of Egress
Reference: IBC 1026	**Subject:** Horizontal Exits

Code Text: *A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit minimum width or required capacity shall be horizontal exits.* See the exceptions for Group I-2 and I-3 occupancies. *The refuge area of a horizontal exit shall be a space occupied by the same tenant or public areas and each such area of refuge shall be adequate to house the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment.*

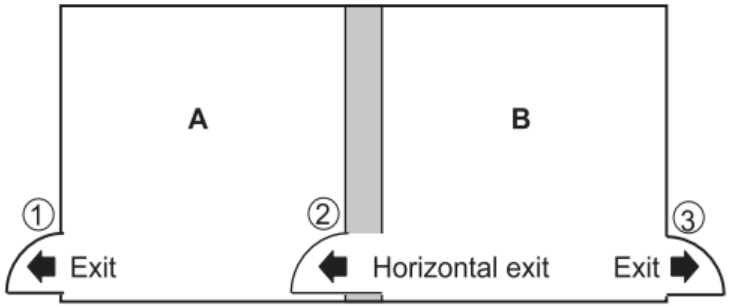
Discussion and Commentary: A horizontal exit is defined as a path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith. Constructed as a minimum 2-hour fire wall or fire barrier, a horizontal exit is an exit component of the means of egress system.

AC 031 - Horizontal exits explained. FINALLY! - YouTube

Source: 2021 IBC



* must be self-closing or automatic closing upon activation of a smoke detector



NOTE: Exit for "A" adequate to meet the provisions of Chapter 10 but need not include added capacity imposed by occupants entering through horizontal exit from "B."

Horizontal exits must extend vertically through all levels of the building, unless minimum 2-hour floor assemblies with no unprotected openings are provided. The horizontal exit walls are to extend continuously from exterior wall to exterior wall in order to completely divide the floor.

Source: 2021 IBC

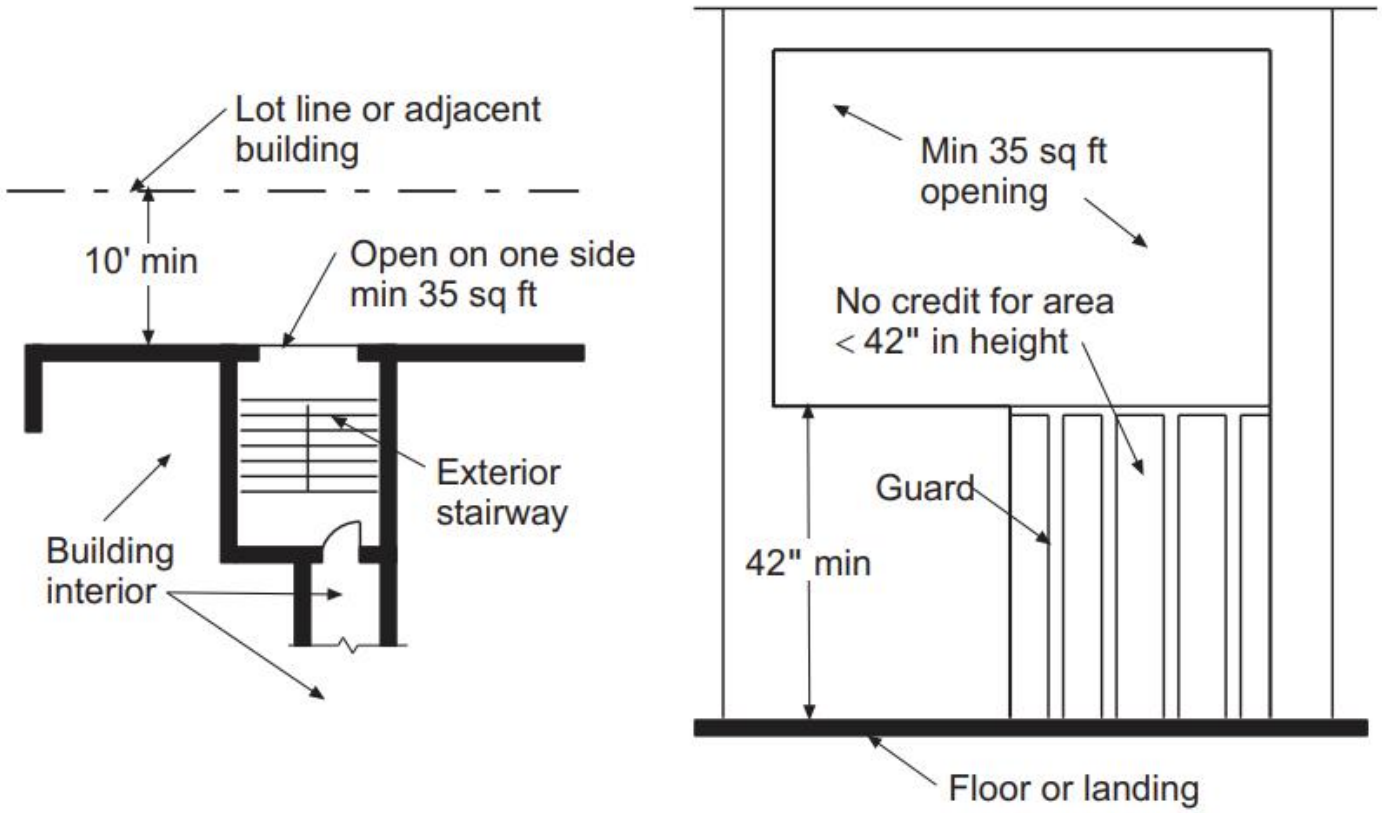
Topic: Open Side | **Category:** Means of Egress

Reference: IBC 1027.3 | **Subject:** Exterior Exit Ramps and Stairways

Code Text: *Exterior exit stairways and ramps serving as an element of a required means of egress shall be open on not less than one side. An open side shall have not less than 35 square feet (3.3 m^2) of aggregate open area adjacent to each floor level and the level of each intermediate landing. The required open area shall be located not less than 42 inches (1067 mm) above the adjacent floor or landing level.*

Discussion and Commentary: For a stairway or ramp to be considered exterior, it must be open enough to the outside so that smoke and toxic gases will not tend to corrupt the exit route. An exterior exit ramp or exterior exit stairway is considered an exit component and is permitted as an egress element in all occupancies except Group I-2. Where permitted as an element of a required means of egress, an exterior exit stairway is limited to buildings with a maximum of 6 stories and no more than 75 feet in height above the lowest level of fire department vehicle access.

Source: 2021 IBC



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.093 m^2.

Consistent with the requirements for other exit components, an exterior exit ramp or stairway must be separated from the remainder of the building by fire-resistance-rated construction and protected openings. The IBC provides four exceptions where separation is not warranted.

Source: 2021 IBC

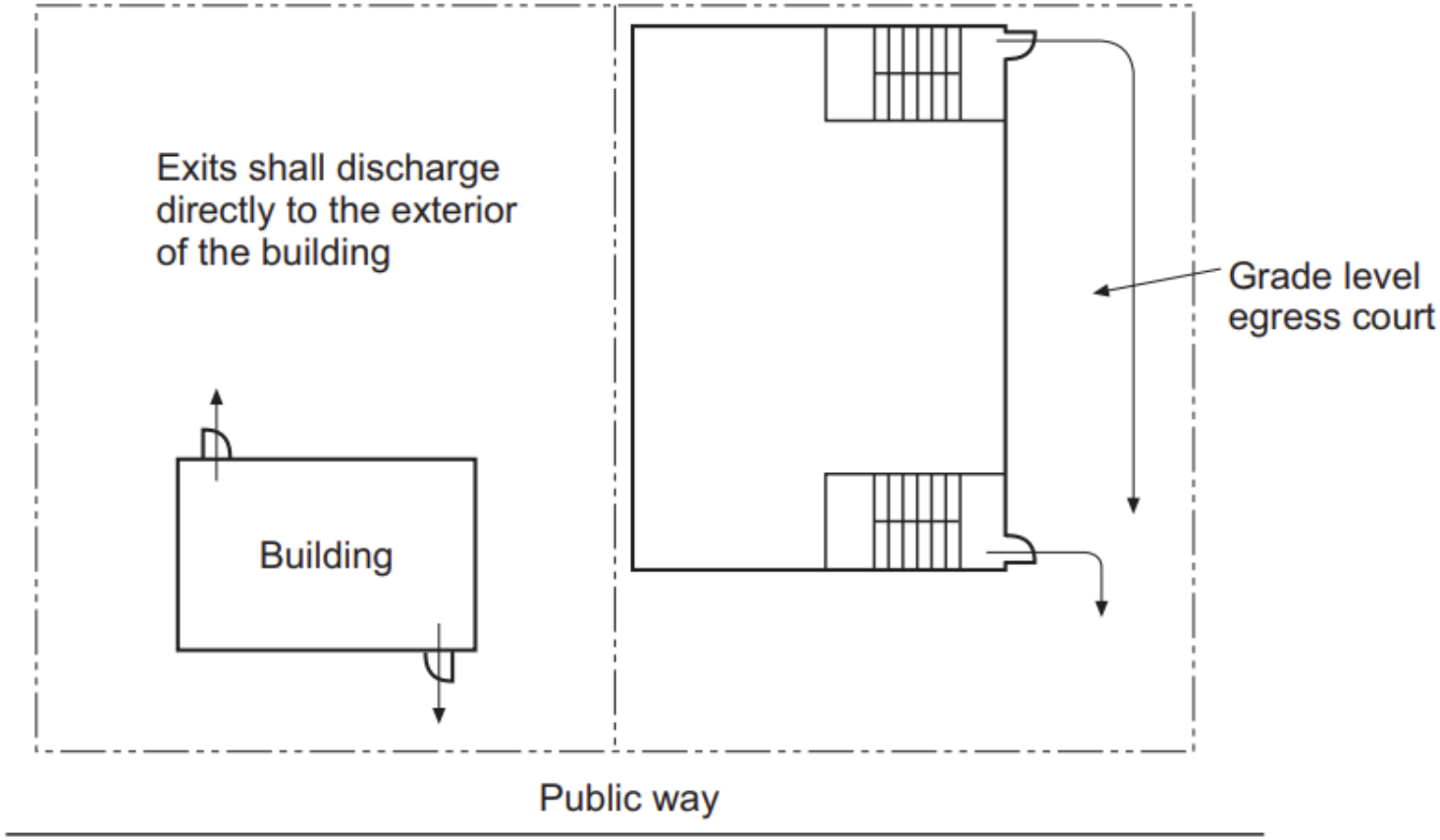
Topic: Definition and Scope | **Category:** Means of Egress

Reference: IBC 1028.2, 1028.4, 202 | **Subject:** Exit Discharge

Code Text: The exit discharge is *that portion of a means of egress system between the termination of an exit and a public way. Exits shall discharge directly to the exterior of the building.* See the exceptions for discharge level spaces, vestibules and horizontal exits. *The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. Exit discharge components shall be sufficiently open to the exterior so as to minimize the accumulation of smoke and toxic gases.*

Discussion and Commentary: Exit discharge travel typically takes place outside of the building, where hazards to the occupants are greatly reduced. Although concern over the accumulation of smoke and toxic gases is eliminated, there is still a risk to the occupants, which is eliminated only at a point of considerable distance from the structure, generally the public way.

Source: 2021 IBC



Number of exits maintained until arrival at grade or public way

When specific conditions are met, up to 50 percent of the number and capacity of interior exit stairways may exit through a vestibule or an area on the discharge level, provided all the stated conditions have been met.

Source: 2021 IBC

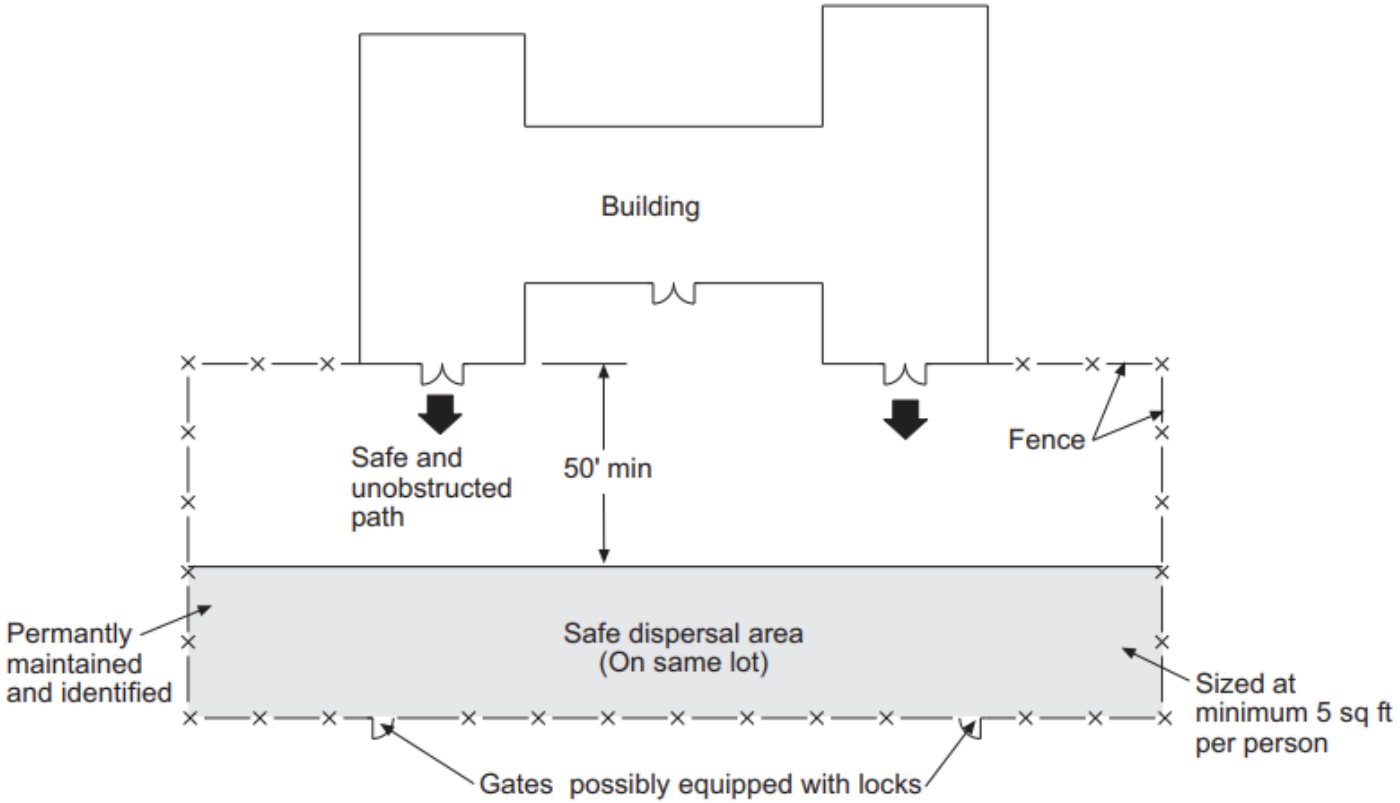
Topic: Access to a Public Way | **Category:** Means of Egress

Reference: IBC 1028.5 | **Subject:** Exit Discharge

Code Text: *The exit discharge shall provide a direct and unobstructed access to a public way.* See the exception for designation of a safe dispersal area where access to a public way cannot be provided.

Discussion and Commentary: The means of egress is not complete until the occupants of the building have reached a safe place. Such a place is typically a public way, in that it is relatively unobstructed, and more importantly, continuous. It is always possible to continue egress travel along a public way until the necessary level of safety is achieved. The path to reach the public way, as for all other components of the means of egress, must be free of obstructions and other concerns that would cause the occupants' egress travel to be delayed, restricted or unavailable. It is important that the travel path outside of the building be continuously maintained in order to keep the means of egress in a complying condition.

Source: 2021 IBC



For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

Safe dispersal areas

Occasionally it is impractical, and at times impossible, to provide a fully complying means of egress the entire distance to the public way. A safe dispersal area can be utilized where such conditions exist, such as on large industrial or educational campus sites.

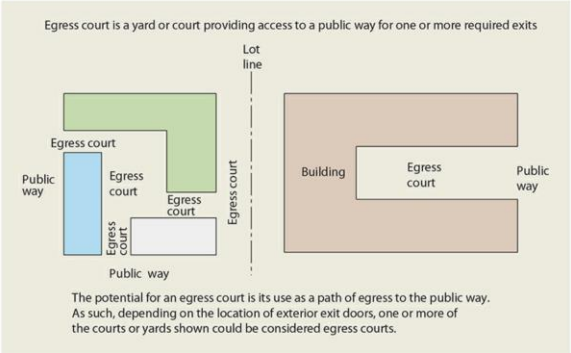
Source: 2021 IBC

Topic: Egress Courts | **Category:** Means of Egress

Reference: IBC 1029.3 | **Subject:** Exit Discharge

Code Text: *Where an egress court serving a building or portion thereof is less than 10 feet (3048 mm) in width, the egress court walls shall be not less than 1-hour fire-resistance-rated construction for a distance of 10 feet (3048 mm) above the floor of the court. Openings within such walls shall be protected by opening protectives having a fire protection rating of not less than $^{3}/_{4}$ hour.* See the exceptions for small occupant loads and Group R-3 occupancies.

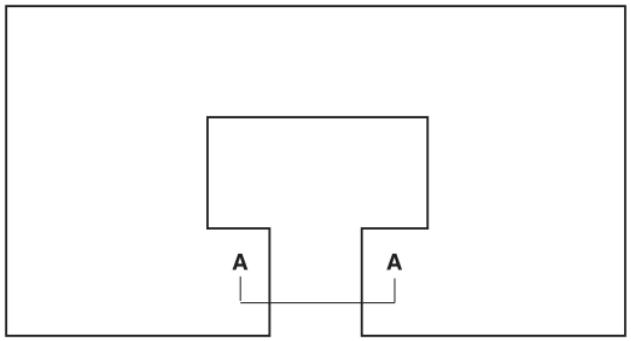
Discussion and Commentary: An egress court is defined as a court or yard which provides access to a public way for one or more exits. Because an egress court is an element of the exit discharge, occupants must be afforded sufficient protection from a fire within the structure to be reasonably sure that once outside they will reach the safety of a public way. Therefore, fire-resistance-rated exterior walls and openings must be provided where such occupants must travel adjacent to an exterior wall in order to reach the public way.

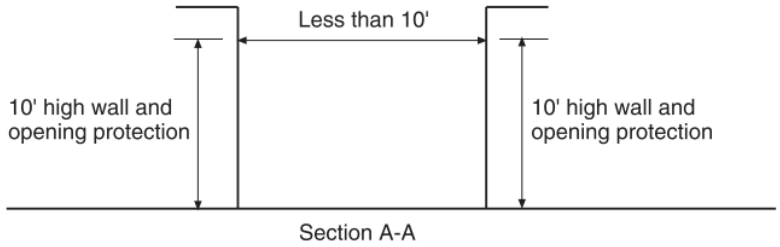


Source: 2021 IBC

Topic: Egress Courts | **Category:** Means of Egress

Reference: IBC 1029.3 | **Subject:** Exit Discharge





For SI: 1 foot = 304.8 mm

The minimum required width of an egress court is addressed in a manner similar to that of aisles, corridors and stairways. The width must accommodate the calculated capacity, based on occupant load served; however, in no case may it be less than a specified width of 44" (36" in Group R-3).

Source: 2021 IBC

Topic: Assembly Main Exit | **Category:** Means of Egress

Reference: IBC 1030.2 | **Subject:** Assembly Seating

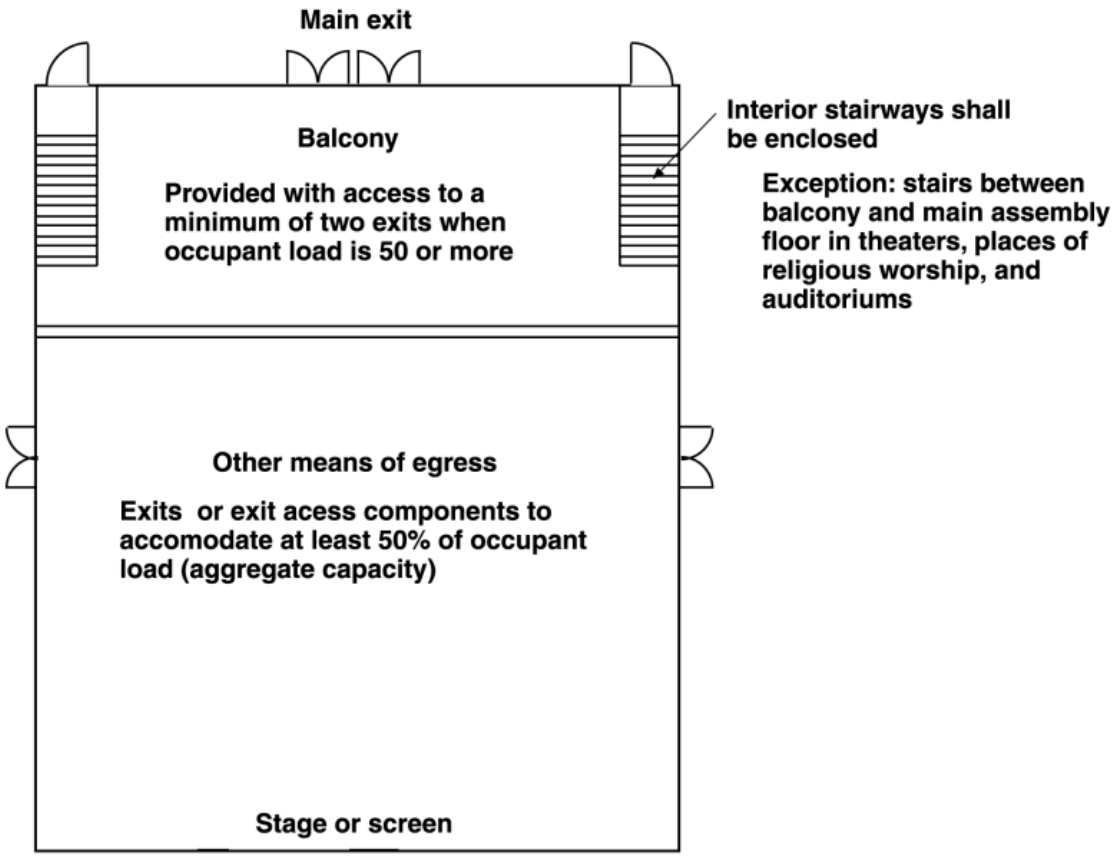
Code Text: *A building, room or space used for assembly purposes that has an occupant load of greater than 300 and is provided with a main exit, that main exit shall be of sufficient capacity to accommodate not less than one-half of the occupant load, but such capacity shall not be less than the total required capacity of all means of egress leading to the exit.*

Discussion and Commentary: In most assembly-type uses, the occupants tend to enter the room or space at a single location. It is expected that under emergency conditions, most of the occupants will attempt to exit at the same point. Therefore, the main entrance/exit must be wide enough to handle a sizeable percentage of the occupants. If there is no well-defined main exit or where multiple main entrance/exits are provided, the required exit width can be distributed among the exits around the perimeter of the building.

Source: 2021 IBC

Topic: Assembly Main Exit
Category: Means of Egress
Reference: IBC 1030.2
Subject: Assembly Seating

Main exit to accommodate at least 50% of occupant load (not less than total required capacity of all egress components leading to exit)



To better define and maintain the egress path through a lobby or foyer to the main entrance/exit in a Group A-1 occupancy, the code mandates that the waiting area not encroach upon the required clear egress width.

Source: 2021 IBC

Topic: Seating at Tables
Reference: IBC 1030.13.1.1, 1030.13.1.2

Category: Means of Egress
Subject: Exit Access

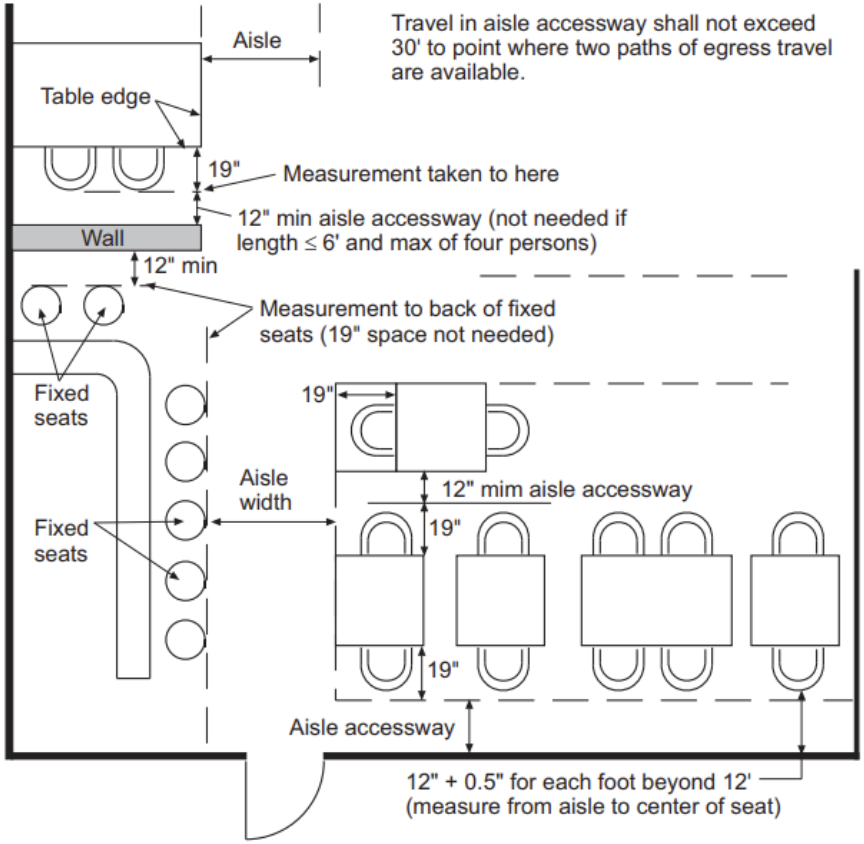
Code Text: *Aisle accessways serving arrangements of seating at tables or counters shall have sufficient clear width to conform to the capacity requirements of Section 1005.1, but shall not have less than 12 inches (305 mm) plus $^{1}/_{2}$ inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.* See the exception for aisle accessways of limited lengths and occupant loads. *The length of travel along the aisle accessway shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of egress travel to separate exits.*

Discussion and Commentary: To facilitate progress toward an established aisle, it is important that a minimum degree of egress width be established within areas furnished with tables and chairs. An aisle accessway, defined as that portion of an exit access that leads to an aisle, is thus regulated.

Source: 2021 IBC

Topic: Seating at Tables
Reference: IBC 1030.13.1.1, 1030.13.1.2

Category: Means of Egress
Subject: Exit Access



For SI: 1 inch = 25.4 mm.

The method of determining the clear width differs based on the type of seating that is provided. For fixed seats, the measurement is made from the back of the seats. Otherwise, the clear width is measured to a line 19 inches from the edge of the table or counter.

Source: 2021 IBC

Topic: Handrails	**Category:** Means of Egress
Reference: IBC 1030.16	**Subject:** Assembly Seating

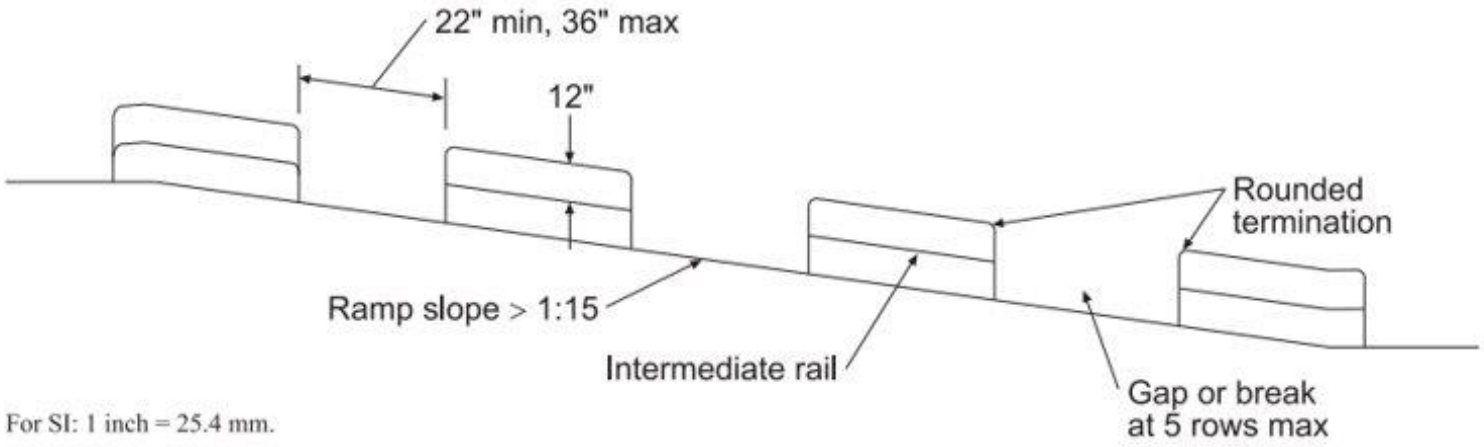
Code Text: *Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped aisles shall be provided with handrails in compliance with Section 1014 located either at one or both sides of the aisle or within the aisle width.* See the exceptions for (1) ramped aisles with a slope no greater than 1:8 with seating on both sides, (2) guards that comply with the graspability requirements of handrails and (3) where crossovers are permitted within the aisles. *Where there is seating on both sides of the aisle, the mid-aisle handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other.*

Discussion and Commentary: Where seating is located on both sides of an aisle, the required handrails may be placed either on both sides of, or down the center of, the aisle served. Where seating is located on only one side of the aisle, a handrail is only required on one of the sides.

Source: 2021 IBC

Topic: Handrails
Reference: IBC 1030.16

Category: Means of Egress
Subject: Assembly Seating



Where discontinuous handrails are provided, an intermediate handrail located 12 inches below the main handrail is required to prevent users from ducking under the handrail and hindering flow. It also provides a handrail for toddlers who may be using the aisle.

Source: 2021 IBC

Topic: Required Openings | **Category:** Means of Egress

Reference: IBC 1031 | **Subject:** Emergency Escape and Rescue

Code Text: *In addition to the means of egress required by* Chapter 10, *emergency escape and rescue openings shall be provided in the following occupancies: (1) Group R-2 occupancies located in stories with only one exit or access to only one exit as permitted by Tables 1006.3.4(1) and 1006.3.4(2), and (2) Group R-3 and R-4 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have not fewer than one emergency escape and rescue opening in accordance with Section 1031.* See the four exceptions, including one for basements with a ceiling height of less than 80 inches and one for small basements without habitable spaces. *Such openings shall open directly into a public way or a yard or court that opens to a public way.*

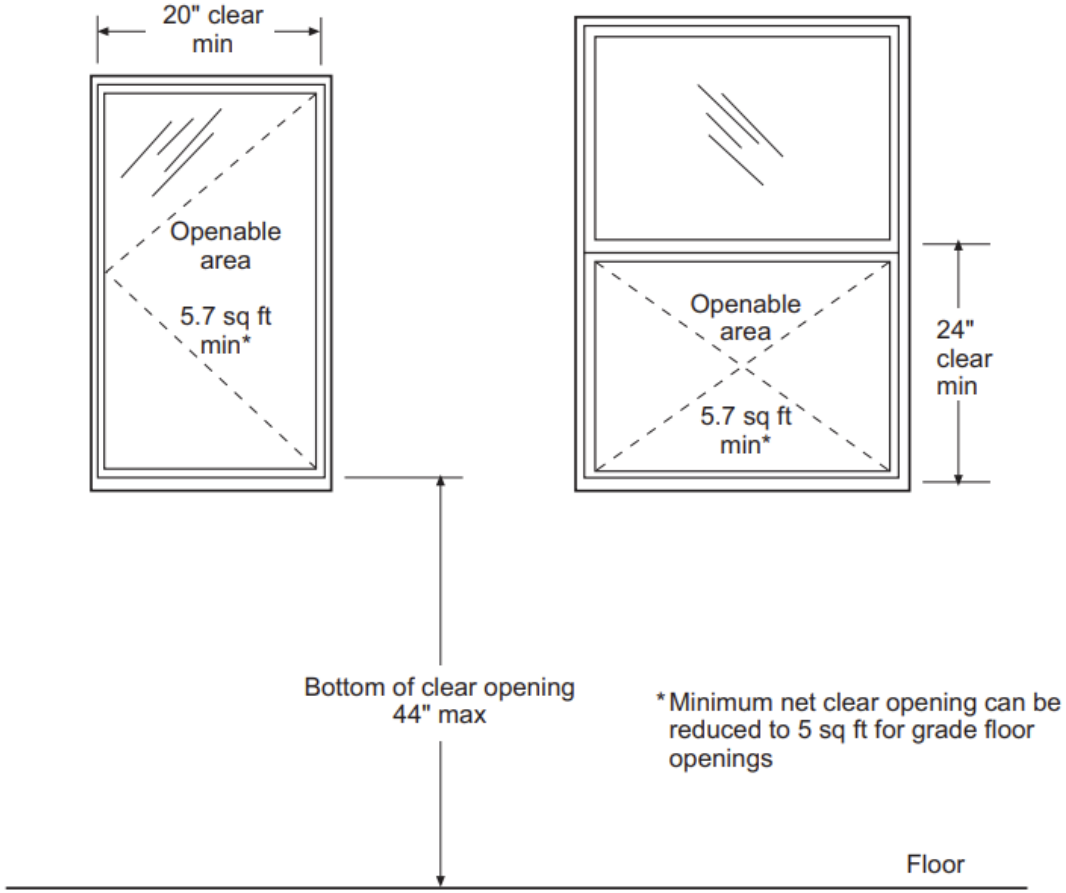
Discussion and Commentary: In those occupancies where persons are sometimes sleeping, a fire will often spread quickly and block the normal egress routes. By requiring a sizeable opening directly from the sleeping room to the exterior, rescue can be more easily accomplished, or alternatively, the occupants may escape without having to travel through the building.

Emergency Escape and Rescue Opening (Egress Window) Size and Height - YouTube

Egress Windows: Basements & Bedrooms - YouTube

Source: 2021 IBC

Topic: Required Openings
Category: Means of Egress
Reference: IBC 1031
Subject: Emergency Escape and Rescue



For SI: 1 square foot = 0.093 m^2, 1 inch = 25.4 mm.

[Egress Windows For Fire Safety | What Are They? Where Are They Needed? - YouTube]

When operable windows are used for egress or rescue purposes, the intent is that they be double-hung, horizontal sliding or casement styles operated by a simple operation. Special types other than those listed must be evaluated for compliance with the operational constraint limitations.

Source: 2021 IBC

Topic: Window Wells | **Category:** Means of Egress

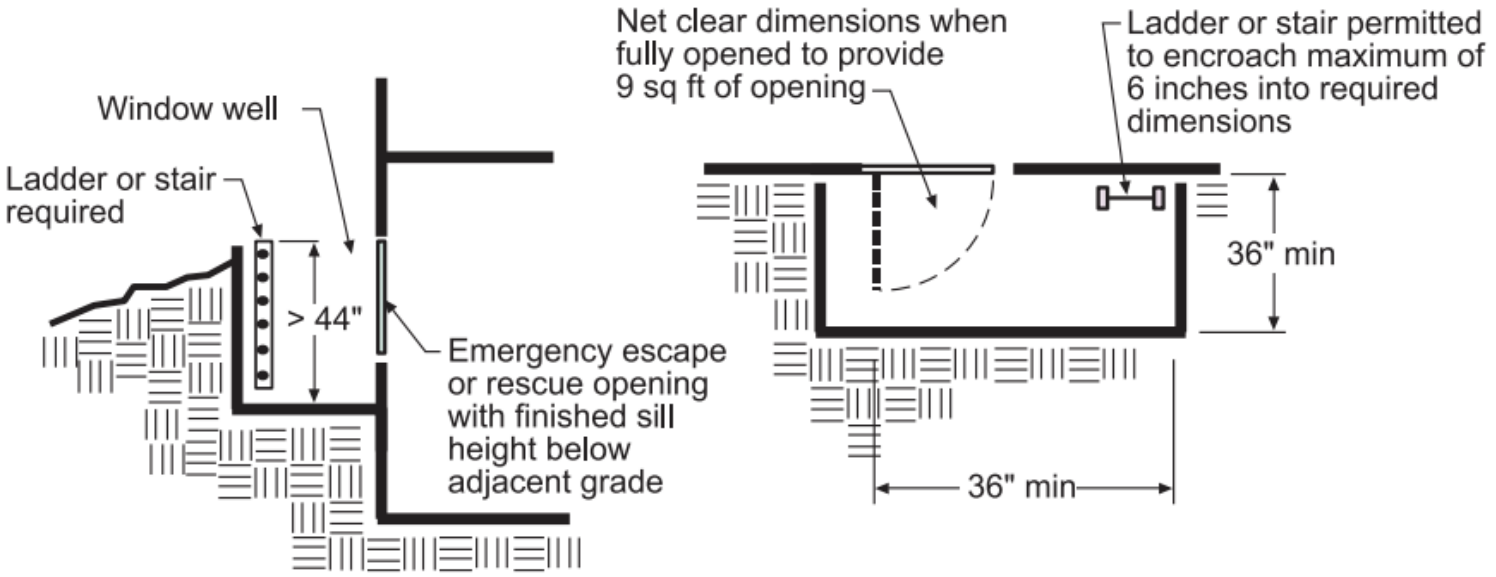
Reference: IBC 1031.4 | **Subject:** Emergency Escape and Rescue

Code Text: *An emergency escape and rescue opening with a finished sill height below the adjacent ground level shall be provided with a window well in accordance with Sections 1030.4.1 and 1030.4.2. The minimum horizontal area of the window well shall be 9 square feet (0.84 m^2), with a minimum dimension of 36 inches (914 mm). The area of the window well shall allow the emergency escape and rescue opening to be fully opened. Window wells with a vertical depth of more than 44 inches (1118 mm) shall be equipped with an approved permanently affixed ladder or steps.*

Discussion and Commentary: It is important that persons who travel through an emergency escape and rescue opening located below grade be provided with adequate space in the window well to allow for escape or rescue from the area. Therefore, a complying window well is mandated that provides an adequate cross-sectional area for escape and rescue operations.

Source: 2021 IBC

Topic: Window Wells
Category: Means of Egress
Reference: IBC 1031.4
Subject: Emergency Escape and Rescue



For SI: 1 inch = 25.4 mm, 1 square foot = 0.093 m^2.

Window well ladders must have a minimum clear rung width of 12 inches with the rungs spaced at maximum 18-inch intervals vertically. The ladder or steps cannot encroach into the required dimensions of the window well more than 6 inches.

Source: 2021 IBC

Midterm – Extra Credits (CH 1 to 10)

You have an opportunity to earn extra credit points for the IBC course by making videos or writing essays on the topics covered in the course. You can pick any five topics that interest you and create a video or an essay for each one. The videos should be clear and engaging and use real life examples or site visits to demonstrate your understanding of the topic. The videos should be at least 3 minutes long and not more than 5 minutes long. The essays should be 500 words long. You will get one extra credit point for each video or essay you submit.

Title your Youtube Video OR 500 words Report in following format IBC#- Topic Name

For example:
IBC 510.7 Open Parking Garages
You should cover following content:
Definition, History why the code was developed, Specification a building inspector should consider reviewing the code.

Class Project (20 Points)

Team of 3 to 4 students
Inspection Report writing

Commercial Property Inspection Preliminary Walkthrough - YouTube ← How to conduct property inspection

Flow of a Restaurant Inspection - YouTube

Office Suite Inspection - YouTube ← Examples

Extra Credit!

- Create a 10 minute video with your team demonstrating your inspection walk through. Each team member should have a chance to speak in the video. (+5 Points)

Class Project (20 Points)

Format

INSPECTION REPORT

Building Address

Executive Summary

Chapters 1 and 35—Scope and Administration

Chapter 3 and Sections 508 and 509

Chapter 6—Types of Construction

Chapter 5—General Building Heights and Areas

Sections 701 through 705—Fire and Smoke Protection Features I

Sections 706 through 712— Fire and Smoke Protection Features II

Update

Contents

Minimum 300 word each chapter (Photos are encouraged)

Class Project (20 Points)

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