

2023 Advanced Building Code, 8th Edition – Means of Egress - Internet



TITAN CONTINUING EDUCATION

This course is designed to familiarize code officials, fire officials, design professionals, and contractors with an overview of the means of egress requirements of the Florida Building Code and includes many of the important changes occurring in the 8th Edition (2023) Florida Building Code, Building Volume, Chapter 10 (Means of Egress).

This course provides an overview of the means of egress requirements contained in Chapter 10 and will also assist code users in identifying some of the specific code changes that have occurred and to understand specific aspects of the changes. Only a portion of the total number of code changes to the Chapter 10 are discussed. The changes selected were identified for a number of reasons, including their frequency of application, special significance, or change in application.

Below is a list of preceding code editions and their effective dates:

- 2001 Edition
 - Effective 2002 - March 2002 and June 2003 Supplements
- 2004 Edition
 - Effective 2005 – Nov. 2005 & Dec. 2006 Supplements
- 2007 Edition
 - Effective 2009 – March 2009 Supplement
- 2010 Edition
 - Effective March 15, 2012
- 5th Edition (2014)
 - Effective June 30, 2015

- 6th Edition (2017)
 - Effective December 31, 2017
- 7th Edition (2020)
 - Effective January 1, 2021
- 8th Edition (2023)
 - Anticipated to become effective January 1, 2023

Chapter 10 Means of Egress:

FBC Chapter 10 governs the arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof. These requirements are meant to provide safe and discernable exiting of occupants from building spaces and the building entirely toward a public way in the case of a fire event or similar emergency.

1003.3.1 Headroom.

When an occupant is proceeding to exit a space or building, it is important that sufficient headroom is provided to prevent injury. The minimum headroom clearance over all walking surfaces that are circulation paths is nominally required to be maintained at 80 in. (6.7 ft.). Where the vertical clearance along a walking surface is less than 80 in. (e.g., underneath a stairway), a barrier that is detectable by a person using a cane must be provided. This could be accomplished with a wall, a rail, a planter, or fixed seating. Persons with a visual impairment who use a long cane for guidance must have sufficient warning of a protruding object. Where protrusions are located higher than 27 in. above the floor, the cane will most likely not encounter the protrusion before the person collides with the object. Additionally, a person with visual impairment may have difficulty identifying protruding objects higher than 27 in.

The 8th Edition of the FBC clarifies that door closers and stops are allowed to be provided with a clearance of 78 in. since these devices are normally mounted away from the center of the door opening, which would minimize the potential for contact with a person passing through the door opening.

- *Protruding objects are permitted to extend below the minimum ceiling height required by Section 1003.2 where a minimum headroom of 80 inches (2032 mm) is provided over any walking surface, including walks, corridors, aisles and passageways. Not more than 50 percent of the ceiling area of a means of egress shall be reduced in height by protruding objects.*

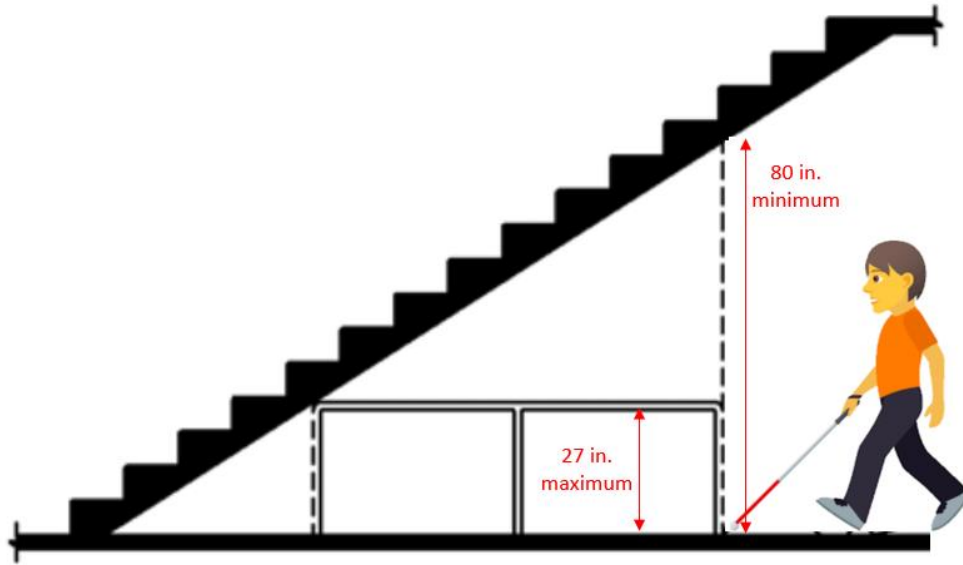
Exception: ~~Door closers, and stops shall not reduce headroom to less~~ overhead door stops, frame stops, power door operators and electromagnetic door locks shall be permitted to project into the opening height not lower than 78 inches (1981 mm).

A barrier shall be provided where the vertical clearance is less than 80 inches (2032 mm) high. The leading edge of such a barrier shall be located 27 inches (686 mm) maximum above the floor.

Door Closer



Reduced Vertical Clearance



1004.8 Concentrated Business Use Areas

Section 1004 of the FBC requires that occupant loads of building spaces be calculated as part of the determination of the adequacy of the means of egress system. For instance, the required width of exit stairways is often a function of the occupant load served to prevent unsafe congestion/delay of occupants during an evacuation. For business areas, earlier versions of the FBC prescribed the occupant loading of business spaces as one occupant per 100 gross square feet, regardless of the arrangement of office spaces. Newer version of the FBC now differentiate between concentrated and unconcentrated business uses. If business areas are relatively sparsely populated (e.g., private office spaces), Table 1004.5 of the FBC specifies one occupant per 150 gross square feet. However, if business areas are more densely populated (e.g., office desk bullpens), Section 1004.8 of the FBC specifies one occupant per 50 gross square feet.

- *The occupant load factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data processing centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where approved by the building official, the occupant load for concentrated business use areas shall be the actual occupant load, but not less than one occupant per 50 square feet (4.65 m²) of gross occupiable floor space.*

1006.2.1 Egress Based on Occupant Load and Common Path of Egress Travel.

Where a given building space has an occupant load above a certain threshold and/or common path of egress travel distance, two exits are specified. These thresholds are provided in Table 1006.2.1 of the FBC based upon the occupancy of the given building space. For instance, two exits or exit access doors are required if the occupant load and/or common path of egress travel distance is greater than 49 persons and 75 ft for a Group A (assembly) occupancy (same whether the given space is protected by a fire sprinkler system or not). In comparison, two exits or exit access doors are required if the occupant load and/or common path of egress travel distance is greater than 3 persons and 25 ft for a Group H-1 (high hazard) occupancy (protected by a fire sprinkler system). Common path of egress travel distance is defined as 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.

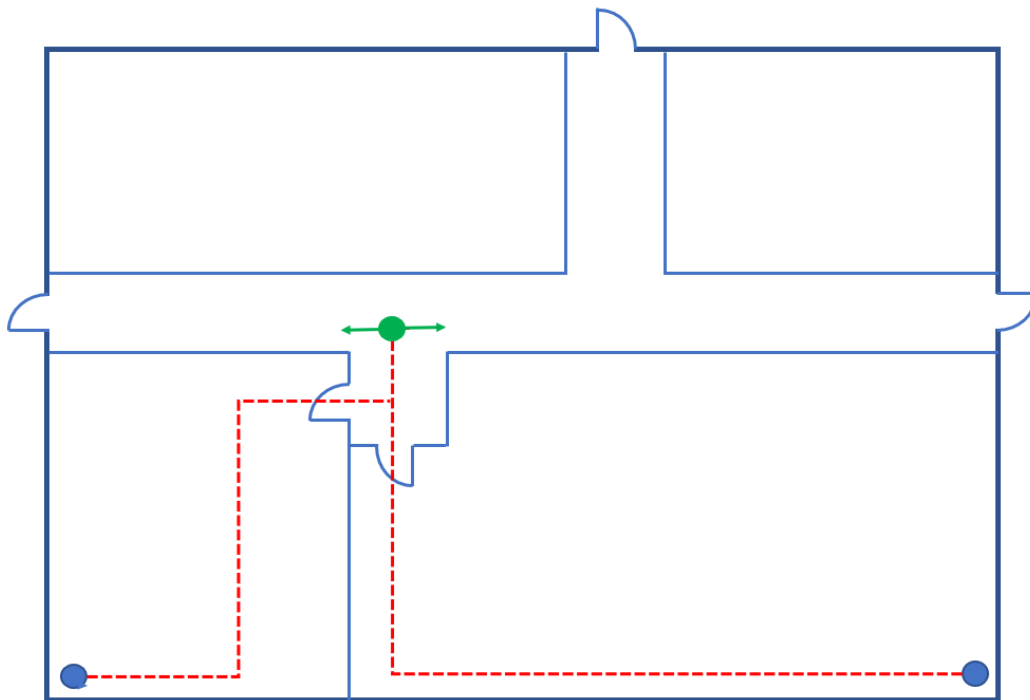
The 8th Edition of the FBC has added a new exception to this section pertaining to unoccupied mechanical rooms and penthouses. Such spaces are usually temporarily accessed for maintenance purposes only, so providing two exits or exit accesses from these spaces is less of a concern.

- *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. The cumulative occupant load from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.*

Exceptions:

1. *The number of exits from foyers, lobbies, vestibules or similar spaces need not be based on cumulative occupant loads for areas discharging through such spaces, but the capacity of the exits from such spaces shall be based on applicable cumulative occupant loads.*
2. *Care suites in Group I-2 occupancies complying with Section 407.4.*
3. *Unoccupied mechanical rooms and penthouses are not required to comply with the common path of egress travel distance measurement.*

Common Path of Egress Travel Distances:



1006.2.2.2 Refrigeration Machinery Rooms.

Similar to Section 1006.2.1 of the FBC, this section provides conditions when two exits or exit accesses are required, but specifically pertaining to refrigeration machinery rooms (regardless of the occupancy definition). Instead of occupant load and/or common path of egress travel distance, this section provides a floor area threshold of 1,000 sq. ft. for when two exits or exit accesses are required from such spaces. In addition to a requirement for exits or exit access doorways to swing in the direction of egress travel, the 8th Edition of the FBC now clarifies that such doors shall be equipped with panic hardware. In a panic situation, a person or persons may have difficulty operating a standard door lever/latch, perhaps due to a crowding of the door. Hence, panic hardware is employed for higher risk areas to allow a person or persons to simply lean into the door to operate its opening latch. Panic hardware must be listed to UL 305 (Standard for Panic Hardware) which includes construction and performance requirements

dealing with endurance, emergency operation, and other tests to ensure that the panic device operates properly.

- *Machinery rooms larger than 1,000 square feet (93 m²) shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.*

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in exit access travel distance is permitted in accordance with Section 1017.1.

Exit or exit access doorways shall swing in the direction of egress travel and shall be equipped with panic hardware, regardless of the occupant load served. Exit or exit access doorways shall be tight fitting and self-closing.

Panic Hardware:



1006.2.2.4 Electrical Rooms.

The 8th Edition of the FBC adds a new section concerning means of egress from electrical rooms. This new section refers the reader to NFPA 70 (National Electrical Code) provisions for the determination of the location and number of exits or exit access doorways from such rooms. Different sections of NFPA 70 are referenced depending upon if the contained electrical equipment is rated above or below 1,000 volts. Also, the installation of panic hardware is specified in accordance with the new Section 1010.2.9.2 of the 8th Edition of the FBC.

- *The location and number of exit or exit access doorways shall be provided for electrical rooms in accordance with Section 110.26 of NFPA 70 for electrical equipment rated 1,000 volts or less, and Section 110.33 of NFPA 70 for electrical equipment rated over 1,000 volts. Panic hardware shall be provided where required in accordance with Section 1010.2.9.2.*

1007.1.1 Exit Remoteness

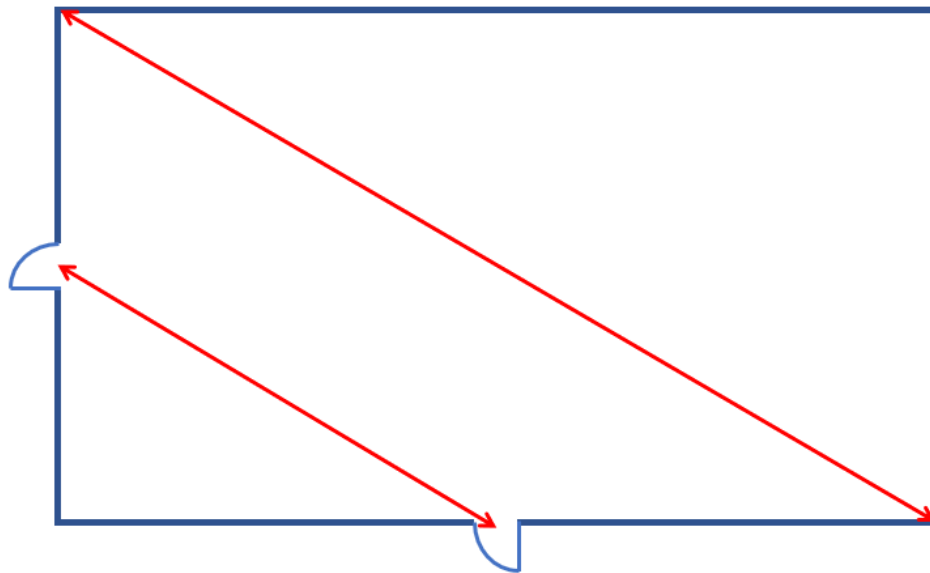
When two exits from a space or floor are required, it is important that these exits are separated from each other by a sufficient distance so that if access to one exit becomes untenable due to fire and smoke, safe access to the other is still provided. To evaluate remoteness, the distance between exits must be at least a certain fraction of the overall diagonal of the space or floor. This fraction is nominally one-half but may be reduced to one-third if the building is protected by an automatic fire sprinkler system. There are also exceptions pertaining to specific corridor conditions. This section of the FBC also clarifies that interlocking or scissor stairways must be considered a single exit, regardless of the separation of the two entrances.

- *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 stairways shall be counted as one exit stairway.*

Exceptions:

1. Where interior exit stairways or ramps are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1020, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance shall be not less than one-third of the length of the maximum overall diagonal dimension of the area served.
3. In Group R1 and R2 occupancies, the distance between exits is not applicable to common nonlooped exit access corridors in a building that has corridor doors from the guestroom or guest suite or dwelling unit, which are arranged so that the exits are located in opposite directions from such doors.

Exit Remoteness Measurements



1008.2.1 Illumination Level Under Normal Power

It is important for a minimum amount of lighting to be present along means of egress pathways in order to permit safe evacuation of building occupants. The nominal intensity of lighting along open plan spaces, aisles, corridors, exit doors and places of exit discharge at walking surfaces must not be less than 1 footcandle (11 lux), which is approximately the lighting intensity as found outdoors at twilight. This relatively low level of lighting renders enough visibility for safe egress. Levels of illumination above walking surfaces may be higher or lower intensity, which allows the use of lights along steps to be used rather than general area lighting if preferred. The 8th Edition of the FBC clarifies that a higher lighting intensity (10 footcandles) is required at walking surfaces of exit stairways when they are in use. The exception addresses specific assembly occupancies where low light intensity is needed for the function of the given building space. For instance, aisle lighting reduced to 0.2 footcandle is sufficient to distinguish the aisles leading to exits without serving as a source of distraction during a performance event.

- *The means of egress illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. Along exit access stairways, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles at the walking surface when the stairway is in use.*

Exception: *For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances by one of the following methods provided that the required illumination is automatically restored upon activation of a premises' fire alarm system:*

1. *Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux).*
2. *Steps, landings and the sides of ramps shall be permitted to be marked with self-luminous materials in accordance with Sections 1025.2.1, 1025.2.2 and 1025.2.4 by systems listed in accordance with UL 1994.*

1010.1.2 Egress Door Types

With notable exceptions, doors within a given means of egress system shall be pivoted or side-hinged swinging type, which should be familiar for building occupants. Pivoted doors hinge from the bottom and top of the door instead of on the side of the door. They are often preferred based on the design element of how they open. In the past, pivot hinges were reserved for larger doors, but more recently they are available in smaller door sizes. The 8th Edition of the FBC extends this provision to balanced door types. A balanced door is a type of swing door mostly used as an exterior entrance door in a public or commercial building. It differs from conventional hinge doors as its unique hardware and mechanical design allows it to bear and efficiently operate a tall and heavy door leaf. The pedestrians can open it easily without much pulling or pushing force, and the door leaf can make a full close by itself.

Notable exceptions to the requirement for side-hinged swinging, pivoted or balanced door types include the allowance for sliding doors serving occupant loads of 10 or less, as well as revolving doors meeting specific requirements.

- *Egress doors shall be of the ~~pivoted or side-hinged swinging door, pivoted door or~~ balanced door types.*

Exceptions:

- 1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.*
- 2. Group I-3 occupancies used as a place of detention.*
- 3. Critical or intensive care patient rooms within suites of health care facilities.*
- 4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.*
- 5. In other than Group H occupancies, revolving doors complying with Section ~~1010.1.4.1~~1010.3.1.*
- 6. In other than Group H occupancies, special purpose horizontal sliding, accordion or folding door assemblies complying with Section ~~1010.1.4.3~~1010.3.3.*
- 7. Power-operated doors in accordance with Section ~~1010.1.4.2~~1010.3.2.*
- 8. Doors serving a bathroom within an individual sleeping unit in Group R-1.*
- 9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.*

1010.1.3 Forces to Unlatch and Open Doors

Doors that are part of a building's means of egress system must be operable by potential users with varying levels of strength. Accordingly, the FBC has long included requirements pertaining to the required opening force for egress doors. The 8th Edition of the FBC adds more specifics to these provisions as it pertains to door hardware that operates by rotation and differentiates between force to unlatch and force to open a given door. The 5-pound maximum force for pushing and pulling manually operated interior swinging egress doors is based on what has been deemed appropriate for people with a physical limitation due to size, age, or disability.

- *~~The forces to unlatch doors shall comply with the following for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5 pounds (22 N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. For other swinging doors, as well as sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force.:~~*
1. *Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (66.7 N).*
 2. *Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).*

The forces to open doors shall comply with the following:

1. *For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).*
2. *For other swinging doors, sliding doors or folding doors, and doors required to be fire rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full-open position when subjected to not more than a 15-pound (67 N) force.*

1010.2.4 Locks and Latches

There often exists conflicting objectives for means of egress and security aspects for buildings. The means of egress is meant to facilitate unobstructed and simple pathways for occupants to leave a building. Conversely, a building's security design is often meant to restrict access pathways to and within a building. Hence, it is important to understand when locks and latches are permitted (often for security purposes) as part of a means of egress system. The 8th Edition of the FBC expands the provisions pertaining to permitted locks and latches within the means of egress system. Notably, conditions for use of locks and latches within certain clinical occupancies is detailed. Also, reference to the new Table 1010.2.4 is provided to specify cases in which manual bolts, automatic flush bolts and constant latching bolts are permitted on the inactive leaf of a pair of doors. Lastly, a few other conditions permitting the use of locks and latches is provided including balconies serving individual dwelling units.

- *Locks and latches shall be permitted to prevent operation of doors where any of the following exist:*
 1. *Places of detention or restraint.*
 2. *In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.*
 3. *In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:*
 - 2.1. *The locking device is readily distinguishable as locked.*
 - 2.2. *A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.*
 - 2.3. *The use of the key-operated locking device is revocable by the building official for due cause.*
 4. *Manual bolts, automatic flush bolts, and constant latching bolts on the inactive leaf of a pair of doors in accordance with Table 1010.2.4, provided that the inactive leaf does not have a doorknob, panic hardware, or similar operating hardware. Where*

- ~~egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.~~
5. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
 6. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.
 7. Doors serving roofs not intended to be occupied shall be permitted to be locked, preventing entry to the building from the roof, provided that when accessing the roof from the building the locks do not automatically lock, preventing re-entry into the building from the roof.
 8. Other than egress courts, where occupants must egress from an exterior space through the building for means of egress, exit access doors shall be permitted to be equipped with an approved locking device were installed and operated in accordance with all of the following:
 - 8.1. The maximum occupant load shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.
 - 8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.
 - 8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.
 - 8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m²) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.
 - 8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.
 - 8.6. The occupant load of the occupied exterior area shall not exceed 300 occupants in accordance with Section 1004.
 9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.
 10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m²) or less serving a private office space.

Manual Bolt Latch



1010.2.7 Stairway Doors

Based on tragic fire experiences where occupants have become trapped in smoke-filled stairway enclosures (e.g., Cook County Administration Building fire in Chicago, IL), stairway doors generally must be arranged to permit reentry into the building without the use of any tools, keys or special knowledge or effort. The desire for locks from the stairway side of stairway doors is usually based on security concerns, notably unauthorized entry into private tenant suites.

However, this section of the FBC contains specific practical exceptions. Notably, such locking is permitted in cases where such doors can be remotely unlocked by fire department personnel in the case of a fire event.

- *Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.*

Exceptions:

1. *Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.*
2. *This section shall not apply to doors arranged in accordance with Section 403.5.3.*

3. *Stairway exit doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.*
4. *Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single exit stairway where permitted in Section 1006.3.3.*
5. *Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the dwelling unit is from a single exit stairway where permitted in Section 1006.3.3.*

Cook County Administration Building (Chicago, IL)



1013.1 Exit Signs

Exit signage within buildings helps occupants identify and discern where exits are located during an evacuation. Exit signs should be visible from all directions along the given exit access route.

In cases where exit signage is not visible to the occupants due to turns in a corridor or due to other floor plan characteristics, additional signage must be provided indicating the direction of egress to an exit. Notably, exit signage must be located so that, where required, the nearest one is within 100 ft of the sign's listed viewing distance.

- *Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.*

Exceptions:

1. *Exit signs are not required in rooms or areas that require only one exit or exit access.*
2. *Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.*
3. *Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.*
4. *Exit signs are not required in dayrooms, sleeping rooms or dormitories in occupancies in Group I-3.*
5. *In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.*

Exit Signage



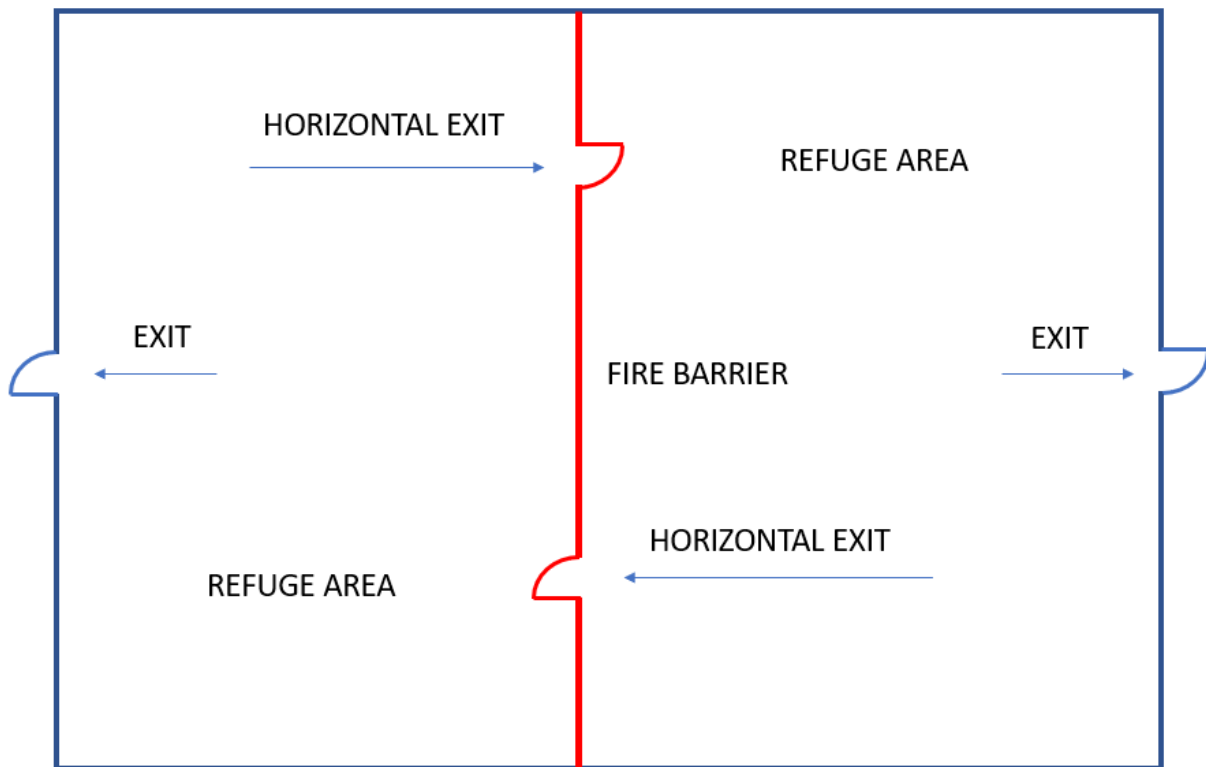
1013.4 Raised Character and Braille Exit Signs

Raised character and braille exit signs (referred to as “tactile” exit signage) are intended to serve as way finding for persons with vision impairments. These represent additional requirements to general exit signage per Section 1013.1 of the FBC. While not required to be illuminated by this section of the FBC, illumination would be advantageous for a person with partial sight. Also, these provisions are not intended to preclude tactile signage from including additional information as long as “EXIT” is shown first. For instance, labeling the door to an exit stairway as “EXIT STAIRWAY” would indicate to a visually impaired person that once they move through the door, they would be dealing with vertical travel, which could be considered an additional safety feature.

The 8th Edition of the FBC clarifies that tactile exit signage requirements also pertain to horizontal exits. A horizontal exit is defined as an exit component consisting of fire-resistance-rated construction and opening protectives intended to compartmentalize portions of a building to create refuge areas that afford safety from the fire and smoke from the area of fire origin. After occupants pass through a horizontal exit, they must be provided not only with sufficient space to assemble but also with access to another exit, such as an exterior door or exit stairway, through which they can exit the building.

- A sign stating *EXIT* in visual characters, raised characters and braille and complying with the Florida Building Code, Accessibility shall be provided adjacent to each door to an area of refuge providing direct access to a stairway, an exterior area for assisted rescue, an exit stairway or ramp, an exit passageway, a horizontal exit and the exit discharge.

Horizontal Exit



1014.2 Handrail Height

Handrails assist occupants to safely navigate certain egress features. Additionally, handrails can also act as an effective barrier, helping to guide and control access. In places where handrails are required (e.g., stairways and ramps) it is important that such components are installed at a permissible height to ensure their effectiveness.

- *Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship's ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).*

Exceptions:

1. *Where handrail fittings or bendings are used to provide continuous transition between flights, the fittings or bendings shall be permitted to exceed the maximum height.*
2. *In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual dwelling units in Group R-2 occupancies; where handrail fittings or bendings are used to provide continuous transition between flights, transition at winder treads, transition from handrail to guard, or where used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.*
3. *Handrails on top of a guard where permitted along stepped aisles and ramped aisles in accordance with Section 1029.16.*

Stairway Handrails



1015.2 Guards

Where one or more sides of a walking surface are open to the floor level or grade below, a guard system must be provided to reduce the possibility of occupants accidentally falling to the surface below. A guard is required only where the difference in elevation between the higher walking surface and the surface below is greater than 30 in. This section of the FBC provides practical exceptions to this requirement, including the audience side of stages and raised platforms. The 8th Edition of the FBC clarifies that the exception also includes the loading side of passenger rail station platforms.

- *Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, aisles, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.8.*

Exceptions: *Guards are not required for the following locations:*

1. *On the loading side of loading docks or piers.*
2. *On the audience side of stages and raised platforms, including stairs leading up to the stage and raised platforms.*
3. *On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.*
4. *At vertical openings in the performance area of stages and platforms.*
5. *At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.*
6. *Along vehicle service pits not accessible to the public.*
7. *In assembly seating areas at cross aisles in accordance with Section 1029.17.2.*
8. *On the loading side of station platforms on fixed guideway transit or passenger rail systems.*

Passenger Rail Station Platform



1016.2.1 Multiple Tenants

After the core and shell of a commercial building is completed, tenant fit-outs often follow in which individual tenants design out their designated space(s). In such cases where a floor is occupied by multiple tenants, each tenant must be provided with clear and direct access to the required exits serving that floor without needing to traverse through other tenant spaces. Notably, tenants typically lock the doors to their spaces for privacy and security. Should an egress door that is shared by multiple tenants be locked, occupants in one of the spaces could be trapped and unable to reach a secondary exit. Hence, it is important that a building's means of egress system be designed to prevent such cases with the practical exception provided in this section of the FBC.

- *Where more than one tenant occupies any one floor of a building or structure, each tenant space, dwelling unit and sleeping unit shall be provided with access to the required exits without passing through adjacent tenant spaces, dwelling units and sleeping units.*

Exception: *The means of egress from a smaller tenant space shall not be prohibited from passing through a larger adjoining tenant space where such rooms or spaces of the*

smaller tenant occupy less than 10 percent of the area of the larger tenant space through which they pass; are the same or similar occupancy group; a discernible path of egress travel to an exit is provided; and the means of egress into the adjoining space is not subject to locking from the egress side. A required means of egress serving the larger tenant space shall not pass through the smaller tenant space or spaces.

1017.3 Exit Access Travel Distance Measurement

The exit access travel distance, as measured from the most remote point within a building to an exit, is limited to restrict the amount of time that it would take occupants to evacuate the building during a fire event. The exit access travel distance must be assumed to be the natural path of travel without obstruction. This commonly results in a rectilinear path similar to what can be experienced in most occupancies, such as a classroom or an office with rows of desks. The 8th Edition of the FBC clarifies that the exit access travel distance is measured to the nearest exit. While each occupant may be required to have access to a second or third exit, the exit access travel distance limitation is only applicable to the distance to the nearest exit. Hence, the distance an occupant must travel to the second or third exit is not regulated. Also, the 8th Edition of the FBC clarifies that the exit access travel distance from certain assembly seating cases must reflect the layout of aisles and aisle accessways per Section 1029.7.

- *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.*

Exceptions:

1. *In open parking garages, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.*
2. *In smoke protected seating and open air assembly seating, exit access travel distance shall be measured in accordance with Section 1029.7.*

1023.5 Interior Exit Stairway Penetrations

Interior exit stairways usually require fire-rated enclosure to facilitate safe passageway of occupants during a fire event. Items that penetrate through such enclosures may reduce their fire resistance. Accordingly, this section of the FBC limits such penetrations to those required for critical systems such a fire sprinkler piping and electricity serving the given stairway. Also, membrane penetrations are permitted on the outside of an interior exit stairway enclosure. A membrane penetration is defined as a breach in one side of a floor-ceiling, roof-ceiling or wall assembly to accommodate an item installed into or passing through the breach.

- *Penetrations into or through interior exit stairways and ramps are prohibited except for equipment and ductwork necessary for independent ventilation or pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and security systems and electrical raceway serving the interior exit stairway and ramp and terminating at a steel box not exceeding 16 square inches (0.010 m²). Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communication openings, whether protected or not, between adjacent interior exit stairways and ramps.*

Exception: *Membrane penetrations shall be permitted on the outside of the interior exit stairway and ramp. Such penetrations shall be protected in accordance with Section 714.4.2.*

1030.4 Emergency Escape and Rescue Openings

Emergency escape and rescue openings are required in certain residential buildings where occupants may be sleeping during a potential fire growth. This would provide another option for escape in the case that access to other exits is untenable due to fire and smoke. Also, such openings provide access in the case of a rescue by emergency responders. If security grilles, decorations or similar devices are installed on emergency escape and rescue windows, such items must be readily removable to permit occupant escape without the use of any tools, keys or force greater than that required for the normal operation of the window. The 8th Edition of the FBC

clarifies that compliant window fall prevention devices and window-opening control devices are permitted.

- *Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Window-opening control devices and fall prevention devices complying with ASTM F2090 shall be permitted for use on windows serving as a required emergency escape and rescue opening. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with Section 1030.2 and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening. Where such bars, grilles, grates or similar devices are installed in existing buildings, smoke alarms shall be installed in accordance with Section 907.2.11 regardless of the valuation of the alteration.*

Course Quiz

1. FBC Chapter 10 governs the arrangement of _____ components.
 - a. means of egress
 - b. structural fire resistance and fire-resistance-rated construction separation of adjacent spaces
 - c. energy storage system electrical hazard mitigation and ventilation
 - d. building zoning
2. FBC 1004.8 specifies one occupant per _____ for concentrated business use.
 - a. 150 gross square feet
 - b. 5 net square inches
 - c. smoke detector
 - d. 50 gross square feet
3. FBC 1006.2.1 requires two exits or exit access doors if the occupant load and/or common path of egress travel distance is greater than _____ for a Group A occupancy.

- a. 5,000 persons and 15 ft
 - b. 1 person and 1,000 ft
 - c. 49 persons and 75 ft
 - d. 4,999 persons and 15 ft
4. FBC 1013.1 requires that exit signage be located so that, where required, the nearest one is within _____ of the sign's listed viewing distance.
- a. 100 ft
 - b. 1 ft
 - c. 2,000 ft
 - d. 1,500 ft
5. Raised character and braille exit signs are often referred to as _____ exit signage.
- a. smoke control
 - b. strategically operated
 - c. tactile
 - d. side-hinged
6. A _____ is defined as an exit component consisting of fire-resistance-rated construction and opening protectives intended to compartmentalize portions of a building to create refuge areas that afford safety from the fire and smoke from the area of fire origin.
- a. balanced door
 - b. horizontal exit
 - c. means of escape
 - d. glazed opening
7. Where one or more sides of a walking surface are open to the floor level or grade below, a _____ must be provided to reduce the possibility of occupants accidentally falling to the surface below.
- a. common path of travel
 - b. fire sprinkler
 - c. heavy timber beam
 - d. guard system
8. Exit access travel distance must be assumed to be the _____.
- a. natural path of travel without obstruction
 - b. 50 ft. from a corridor
 - c. below the level of exit discharge
 - d. in accordance with ASTM 2121

9. _____ from certain assembly seating cases must reflect the layout of aisles and aisle accessways per Section 1029.
- a. Combustible curtains
 - b. Jumping distance
 - c. Exit access travel distance
 - d. Peak running speed
10. Per FBC 1023.5, _____ are permitted on the outside of an interior exit stairway enclosure.
- a. seismic base isolation
 - b. seismic proof rotators
 - c. membrane penetrations
 - d. 1,000-foot spans
11. If security grilles, decorations or similar devices are installed on emergency escape and rescue windows, such items must be _____ to permit occupant escape without the use of any tools, keys or force greater than that required for the normal operation of the window.
- a. readily removable
 - b. Groups X, Y, and Z
 - c. Type XI
 - d. in accordance with NFPA 4001
12. Per 1010.1.2, manually operated sliding doors are permitted (except for Group H occupancies) where serving an occupant load of _____ or less.
- a. 100
 - b. 10
 - c. 5,000
 - d. 512