





Course Description

- This seminar addresses the provisions of Chapter 10 of the 2018 *International Building Code*® (IBC®) regarding specific aspects of the means of egress, those components regulated as “exits.”

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Objectives

Upon completion, participants will be better able to:

- Determine those means of egress components that are defined as "exits"
- Identify where exit elements are required
- Identify the specific technical criteria for exits
- Describe the regulation of the exit discharge system



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Course Overview

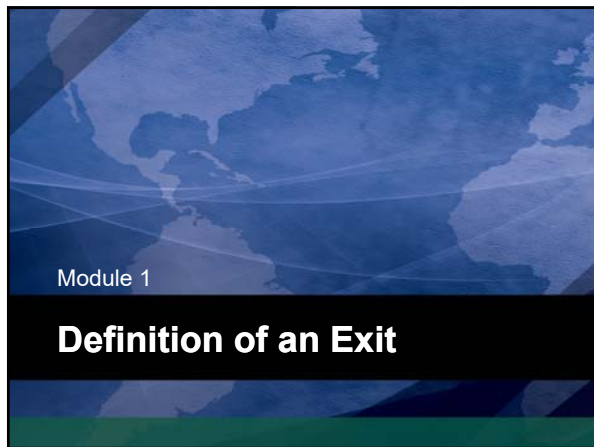
- **Module 1 – Definition of an Exit**
- **Module 2 – Use of Exit Components**
- **Module 3 – Specifics of Exit Components**
- **Module 4 – Exit Discharge**



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Definition of Exit

- The term “exit” is used in the code to describe one of three parts of the means of egress system.
- The means of egress includes:
 - Exit access
 - Exit
 - Exit discharge

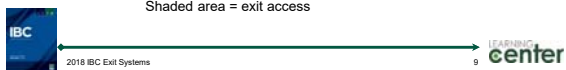
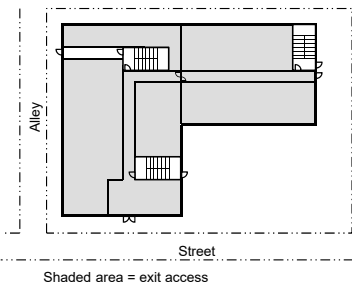


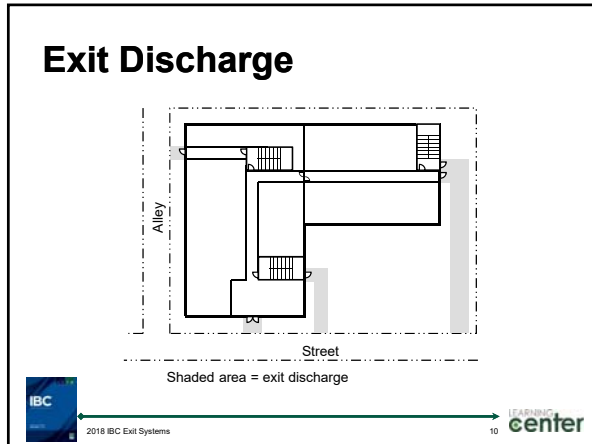
Definition of Means of Egress

- The means of egress is defined as “a continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.



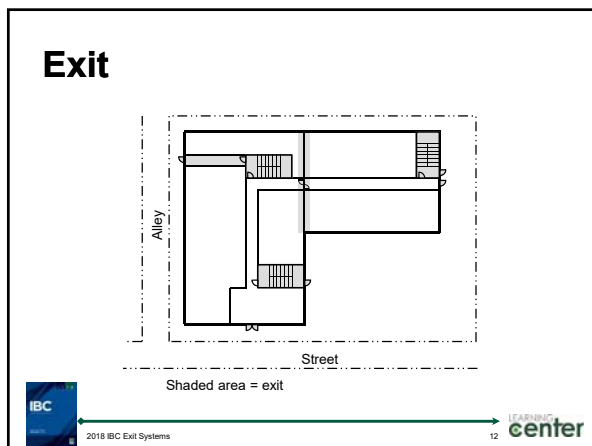
Exit Access





Definition of Exit

- An exit is defined as “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/ramps
 - Exit passageways
 - Exterior exit stairways/ramps
 - Horizontal exits



Definitions of Exit Components

- The individual exit components are also specifically defined in the IBC:
 - Horizontal exit
 - Exit passageway
 - Interior exit stairways
 - Exterior stairway
- The components are further defined by their applicable technical provisions.



Definition of Horizontal Exit

- 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 thereby creating refuge areas that afford safety from the fire and smoke from the area of fire origin.”



Definition of Exit Passageway

- An exit passageway is defined as “an exit component that is separated from 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.”



Definition of Interior Exit Stairway

- An interior exit stairway is defined as “an exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.”



Definition of Exterior Exit Stairway

- An exterior exit stairway is defined as “an exit component that serves to meet one or more means of egress design requirements such as required number of exits or exit access travel distance, and is open to yards, courts or public ways.”



Exit Ramps

- Interior exit ramps and exterior exit ramps are also considered as exit components.
- The definitions and protective provisions for such ramps are consistent with those for interior exit stairways and exterior exit stairways, respectively.



Exterior Exit Doors

- The most common exit component is an exterior exit door at the level of exit discharge.
- Exit doors, whether interior or exterior, are regulated under the provisions of Section 1010.



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Level of Exit Discharge

- The level of exit discharge is also specifically defined as “the story at the point at which an exit terminates and an exit discharge begins.”
- Exit discharge is “that portion of a means of egress system between the termination of an exit and a public way.”



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Concept of Exit Components

- Once reaching an exit component, the occupant is provided with an established degree of protection from fire and smoke.
- Fire-resistance-rated exitways are provided for interior travel, while exterior travel, although above the discharge level, is separated from an interior fire and smoke accumulation such that it is not a concern.



Concept of Exit Components

- Exits are key elements in the design of the means of egress for a variety of reasons, including:
 - Termination point for travel distance limits
 - Number of means of egress from a story



Exits Section 1022.1

- 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 provided, that protection level shall not be reduced until arrival at the exit discharge.
- Exit components are primarily required by Sections 1006 and 1007 addressing the number and configuration of exits.



Exits

Sections 1006 and 1007

- Exits, in addition to the minimum number required by Section 1006, may also need to be provided in order to meet various means of egress design requirements in Chapter 10.
- The most common application is the limit placed on travel distance to an exit component.
 - Other applications include the required separation of exits per Section 1007.



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Number of Exits

Section 1006.1

- The number of exits (as well as exit access doorways) is regulated for
 - Spaces, including mezzanines Section 1006.2
 - Stories and occupied roofs Section 1006.3



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Egress from Spaces

Section 1006.2.1

- Two exits (or exit access doorways) shall be provided from a room, area or space where the design occupant load or the common path of egress travel distance exceeds the values set forth in Table 1006.2.1.



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Egress from Spaces Section 1006.2.1.1

- A minimum of three exits or exit access doorways are required from rooms or spaces having an occupant load of 501 to 1000.
- A minimum of four exits or exit access doorways are required from rooms or spaces having an occupant load of more than 1000.



Egress from Spaces Section 1006.2.2

- Additional provisions address unique egress requirements for:
 - Boiler, incinerator and furnace rooms
 - Refrigeration machinery rooms
 - Refrigerated rooms or spaces
 - Group I-4 infant/toddler day care facilities
 - Group R-3 and R-4 occupancies protected by an NFPA 13D sprinkler system



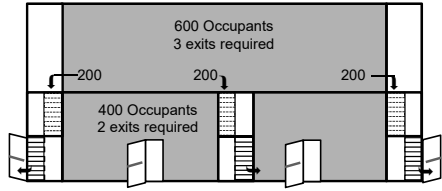
Egress from Stories Section 1006.3

- The minimum required number of separate and distinct exits (or access to exits) from a story or occupied roof is based on the aggregate occupant load served on that story.
 - Where stairways serve more than one story, only the occupant load of each story considered individually is used when calculating the required number of exits (or access to exits) serving that story.



Egress from Stories Section 1006.3

- No cumulative or contributing occupant load from adjacent stories needs to be considered

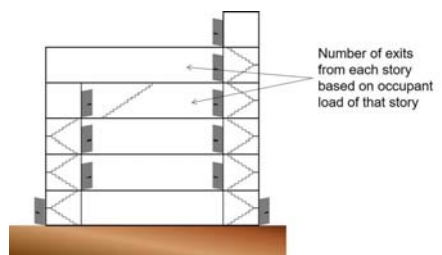


Egress from Adjacent Stories Section 1006.3.1

- In multistory buildings, the use of exit access stairways is selectively permitted.
 - In all other cases, exit components must be utilized as a vertical continuation of the means of egress system.
- The path of egress travel to an exit is typically limited such that travel is not permitted to pass through more than one adjacent story.



Egress from Adjacent Stories Section 1006.3.1



Egress through Adjacent Stories Section 1006.3.1, Exceptions

- Travel through more than one adjacent story is permitted:
 - Within dwelling units of Groups R-1, R-2 and R-3 where stairways connect no more than four stories
 - In Group R-3 congregate residences and Group R-4 facilities
 - In open parking garages where the means of egress serves only the garage
 - For outdoor facilities where all portions of the means of egress are essentially open to the outside
 - For travel between balconies and assembly areas below



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Number of Exits Section 1006.3.2

- Each story or occupied roof must have the minimum number of exits, or access to exits, as set forth in Table 1006.3.2.

TABLE 1006.3.2
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



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Number of Exits Section 1006.3.2

- The required number of exits, or exit access stairways where permitted, from any story or occupied roof shall be maintained until arrival at the exit discharge or a public way.
- It is important that the exits be adequately separated per Section 1007 in order to maintain their independence.



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Single Exits from Stories Section 1006.3.3

- A single exit or access to a single exit is permitted from any story or an occupied roof where in conformance with Section 1006.3.3.
- Five different conditions are set forth where a single exit or access to a single exit is permitted.



Single Exits Section 1006.3.3, Condition 1

- A single exit or access to a single exit is permitted from any story or an occupied roof where the occupant load, number of dwelling units and exit access travel distance do not exceed the values in Table 1006.3.3(1) or 1006.3.3(2).



Number of Exits Table 1006.3.3(1)

**TABLE 1006.3.3(1)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES**

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane	R-2 ^a	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 1030.
 b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, see Table 1006.3.3(2).



Number of Exits Table 1006.3.3(2)

**TABLE 1006.3.3(2)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES**

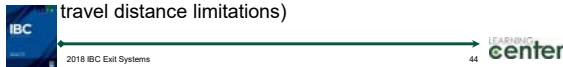
STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)
First story above or below grade plane	A, B ¹ , E, F ¹ , M, U ¹	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2 ^{1a}	10	75
Second story above grade plane	S ^{1b}	29	75
	B, F, M, S ²	29	75
Third story above 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 1030.
 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 1006.3.3(1).
 d. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.



Number of Exits Section 1006.3.3, Conditions 2–5

- In addition to the allowances for single-exit stories in Tables 1006.3.2(1) and 1006.3.2(2), there are a number of other conditions under which a single exit is permitted:
 - Rooms, areas and spaces complying with Section 1006.2.1, provided the exits discharge directly to the exterior at the level of exit discharge
 - Parking garages where vehicles are parked mechanically
 - Group R-3 and R-4 occupancy buildings
 - Individual dwelling units (subject to occupant load and travel distance limitations)



Dwelling Units Section 1006.3.3, Condition 5

- Single exits are permitted within and from dwelling units in single-story and multistory buildings where the:
 - dwelling unit complies as a space with one means of egress, and
 - exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside of the unit's entrance door provides access to at least two exits.

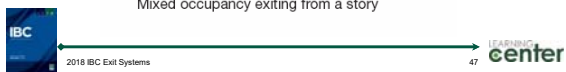
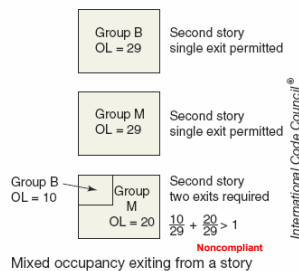


Mixed Occupancies Section 1006.3.3.1

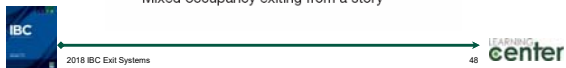
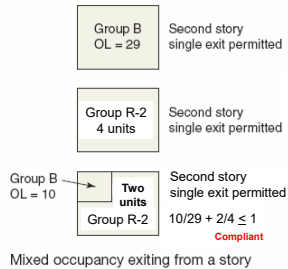
- A single exit or single access stairway may serve multiple occupancies on a story where in compliance with the unity formula:
 - The sum of the ratios of the occupant load of each space divided by the allowable number of occupants as indicated by Table 1006.3.2(2) for each occupancy does not exceed one.
 - Where dwelling units are involved, the actual number of units divided by four is to be added to the ratio of the other occupancy.



Mixed Occupancies Section 1006.3.3.1



Mixed Occupancies Section 1006.3.3.1



Exit Configuration Section 1007.1

- Where multiple exits are required, they shall be adequately separated from each other such that if one exit is blocked, the others are available.
- Exits, exit access doorways, and exit access stairways and ramps serving spaces and individual stories shall be separated in conformance with Section 1007.

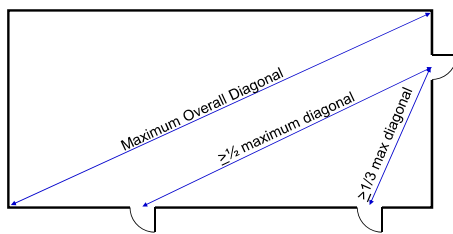


Separation of Two Exits Section 1007.1.1

- Where two exits, exit access doorways, exit access stairways or ramps, or any combination thereof, are required within the exit access, they shall be separated a minimum of $\frac{1}{2}$ of the maximum overall diagonal of the building or area served.
 - Where the building is fully sprinklered, the required separation is reduced to $\frac{1}{3}$ of the overall diagonal.



Separation of Two Exits Section 1007.1.1



Separation of Two Exits Section 1007.1.1.1

- The separation distance required in Section 1007.1.1 shall be measured to:
 - any point along the width of the doorway (exits and exit access doorways)
 - the closest riser (exit access stairways)
 - the start of the ramp run (exit access ramps)
- The separation between two interior exit stairways is measured between the doorways of the stairway enclosures, not the enclosure walls.

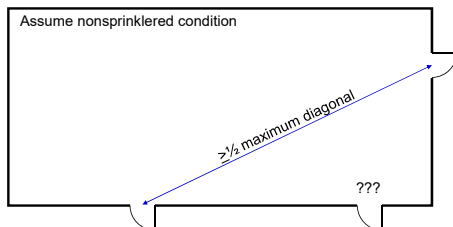


Separation of Three or More Exits Section 1007.1.2

- Where access to three or more exits is required, at least two must be separated in conformance with Section 1007.1.1.
- The additional required exit(s) must be located a reasonable distance from the others so that if one becomes blocked, the others will be available.




Separation of Three or More Exits Section 1007.1.2






**Exterior Doors at the Level of Exit Discharge
Section 1022.2**

- For most buildings, the typical exit components are exterior doors at or near grade.
- This component is considered as a protected element as it leads directly to exterior travel at ground level, providing direct access to a public way with limited, if any, concern for fire and smoke risk.



**Exterior Doors at the Level of Exit Discharge
Section 1022.2**

- Complying doors, including exterior doors, are regulated by Section 1010.
- In addition, Section 1022.2 mandates that all buildings used for human occupancy be provided with at least one exterior door that meets the requirements of Section 1010.1.1 (size of doors).



**Interior Exit Stairways and Ramps
Section 1023.1**

- Interior exit stairways and ramps shall be enclosed and lead directly to the exterior of the building or extended to the exterior through the use of a complying exit passageway.
- As an alternative, extended travel is permitted through an interior exit discharge area as limited by Section 1028.1.
 - Specifics are addressed under the Exit Discharge module of this program.



**Interior Exit Stairways and Ramps
Section 1023.1**

- An interior stairway or ramp shall not be used for any purpose other than:
 - A means of egress
 - A circulation path



**Interior Exit Stairway Construction
Section 1023.2**

- Enclosures for interior exit stairways and ramps are to be constructed as fire barriers or horizontal assemblies, or both.
 - Minimum 2-hour where connecting four or more stories
 - Otherwise, minimum of 1-hour
 - Not less than the rating of the floor assembly penetrated, but no greater than 2 hours



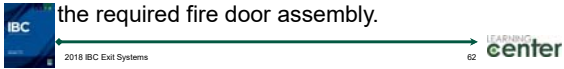
Interior Exit Stairway Termination Section 1023.3

- Interior exit stairways and ramps are to be continuous and terminate at an exit discharge or the public way, except where extended by an exit passageway.
 - Such interior exit stairways and ramps may open into an interior exit discharge condition as established in Exceptions 1 and 2 of Section 1028.1.

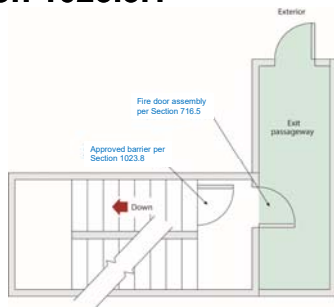


Interior Exit Stairway Extension Section 1023.3.1

- Where interior exit stairways and ramps are extended by an exit passageway, the stairway/ramp shall be separated from the exit passageway by a fire barrier or horizontal assembly, or both.
 - The minimum rating of the fire barrier shall be not less than the required rating for the interior exit stairway/ramp.
- The only opening permitted in the separation between the stairway and exit passageway is the required fire door assembly.



Interior Exit Stairway Extension Section 1023.3.1



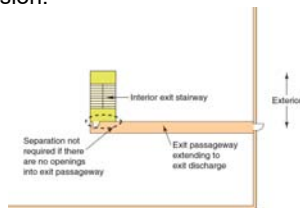
Interior Exit Stairway Extension Section 1023.3.1, Exception 1

- Penetrations of the fire barrier separating the interior exit stairway and the exit passageway are permitted when in compliance with Section 1023.5.
 - Six conditions are identified provided such penetrations are appropriately protected.



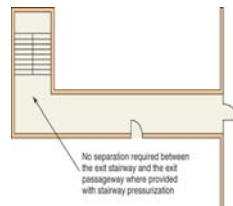
Interior Exit Stairway Extension Section 1023.3.1, Exception 2

- The fire barrier and fire door assemblies are not required where there are no openings in the exit passageway extension.



Interior Exit Stairway Extension Section 1023.3.1, Exception 3

- The fire barrier and fire door assemblies are not required where the interior exit stairway is pressurized and the pressurization is extended to the exit passageway.



Interior Exit Stairway Openings Section 1023.4

- Interior exit stairway and ramp opening protectives shall comply with Section 716.
- Openings other than unprotected exterior openings are limited to those necessary for:
 - Exit access to the enclosure from normally occupied spaces, and
 - Egress from the enclosure.
- Elevators are not permitted to open into interior exit stairways and ramps.

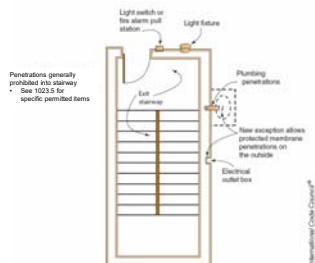


Interior Exit Stairway Penetrations Section 1023.5

- Penetrations into and openings through interior exit stairways are generally prohibited.
- Allowances include:
 - Equipment and ductwork necessary for independent ventilation or pressurization
 - Fire protection systems
 - Security systems
 - Two-way communication systems
 - Electrical raceways serving the enclosure



Interior Exit Stairway Penetrations Section 1023.5, Exception



Interior Exit Stairway Penetrations Section 1023.5

- There shall be no penetrations or communicating openings, whether protected or not, between adjacent interior exit stairways and ramps.



Interior Exit Stairway Ventilation Section 1023.6

- Equipment and ductwork for interior exit stairway and ramp ventilation must:
 - Be located at the building's exterior and directly connect to the enclosure by ductwork in complying shafts, or
 - When located within the enclosure, receive intake air taken directly from the outdoors and exhaust air directly to the outside, or utilize ducts within complying shafts, or
 - When located within the building, be separated from the remainder of the building, including other mechanical equipment, through the use of complying shafts.



Interior Exit Stairway Ventilation Section 1023.6

- Under each of the three ventilation conditions, openings into the fire-resistance-rated construction shall be protected and limited to those needed for maintenance and operation.
- Interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.



Interior Exit Stairway Exterior Walls Section 1023.7

- In addition to the general requirements addressing exterior wall protection, special provisions apply where nonrated walls or unprotected openings enclose the exterior of the stairway and the walls/openings are exposed by other parts of the building at less than 180 degrees.

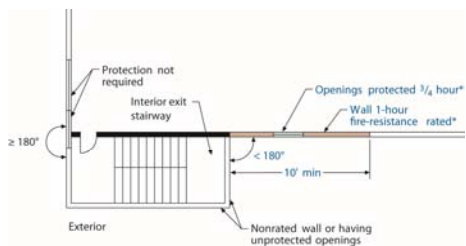


Interior Exit Stairway Exterior Walls Section 1023.7

- Under such conditions, the building exterior walls within 10 feet horizontally of a nonrated wall or opening shall be rated for at least 1 hour.
 - Openings within such walls shall be protected by minimum ¾-hour protectives.
- The fire protection shall extend from the ground at least 10 feet vertically above the topmost landing, or to the roof, whichever is lower.



Interior Exit Stairway Exterior Walls Section 1023.7



* Protected to a height of 10 feet above topmost landing or roof, whichever is less.



Discharge Identification Section 1023.8

- Where an interior exit stairway or ramp continues below its level of exit discharge, an approved barrier must be provided to prevent persons from unintentionally traveling to the level(s) below.
 - Directional exit signage must be provided in addition to the required barrier.

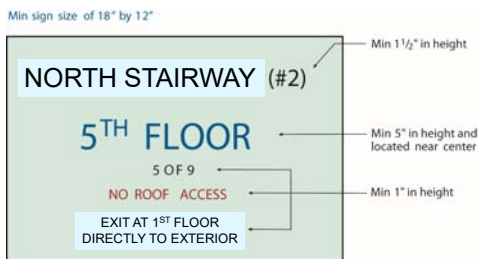


Stairway Identification Signs Section 1023.9

- An informational sign is required at each floor level landing of an interior exit stairway or ramp connecting four or more stories.
- In addition to the stairway identification sign, a floor-level sign in visual characters, raised characters and Braille complying with ICC A117.1 shall be located adjacent to the door leading from the interior stairway or ramp onto the story to identify the floor level.



Stairway Identification Signs Section 1023.9



Elevator Lobby Identification Signs Section 1023.10

- Where the landing of an interior stairway has two or more doors that lead to the floor level, any door with direct access to an enclosed elevator lobby shall be identified.
- A sign shall be located on the door or adjacent to the door that states "Elevator Lobby."
 - Letters shall be at least 1 inch in height and in contrast to their background.



Smokeproof Enclosures and Pressurized Stairways and Ramps Section 1023.11

- As required for high-rise buildings, underground buildings and airport traffic control towers, interior exit stairways and ramps shall be smokeproof enclosures.
 - The requirements for construction and operation are established in Section 909.20.



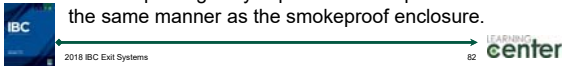
Termination and Extension Section 1023.11.1

- Termination of a smokeproof enclosure shall occur at an exit discharge or the public way.
 - A smokeproof enclosure is permitted to egress through areas on the level of exit discharge as permitted by Section 1028.1 for interior exit discharge.



Termination and Extension Section 1023.11.1

- The extension of a smokeproof enclosure by an exit passageway is permitted where:
 - The exit passageway is without openings other than the fire door assembly required by Section 1023.3.1, and
 - Doors necessary for egress from the exit passageway.
- Openings are permitted within the exit passageway and the fire barrier separating the exit passageway from the smokeproof enclosure is not required provided:
 - The exit passageway is protected and pressurized in the same manner as the smokeproof enclosure.

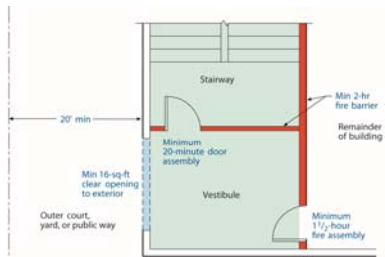


Enclosure Access Section 1023.11.2

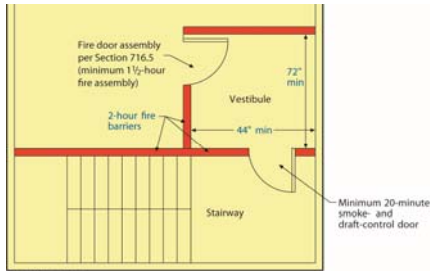
- Unless the pressurization alternative is used, access to the stairway within a smokeproof enclosure shall be by way of a vestibule or an open exterior balcony.



Natural Ventilation Alternative Section 909.20.3



Mechanical Ventilation Alternative Section 909.20.4



For SI: 1 inch = 25.4 mm.

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Stairway Pressurization Alternative Section 909.20.5

- Where the building is fully sprinklered, the vestibule is not required, provided each interior exit stairway is pressurized.
- The pressurization level, in the shaft relative to the building, shall be:
 - Not less than 0.10 inch of water
 - Not more than 0.35 inch of water

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Standpipes Section 1023.12

- Standpipes and standpipe hose connections, where mandated by Section 905.3, are to be located as required by Section 905.4.
 - At every interior stairway, a connection shall be provided for each story above grade plane.
 - Hose connections are to be located at the main floor landing unless otherwise approved by the fire code official.

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Exit Passageways Section 1024.1

- An exit passageway, provides exit travel along a horizontal path, typically as selectively determined by the designer.
- Exit passageways are also mandated by various provisions of the code where highly protected egress travel is necessary.
- An exit passageway shall not be used for any purpose other than as a means of egress and a circulation path.



Exit Passageway Width Section 1024.2

- Exit passageway minimum width and required capacity are regulated in much the same manner as required for corridors.
- The minimum required width is 44 inches, with a reduction to 36 inches permitted where the occupant load served is less than 50.
- Other than permissible encroachments, the minimum width or required capacity must be unobstructed.



Exit Passageway Construction Section 1024.3

- Exit passageway enclosures shall have walls, floors and ceilings with a minimum 1-hour fire-resistance rating
 - Fire barriers or horizontal assemblies, or both, must be provided in order to achieve the required fire-resistance.
- Where connecting interior exit stairways, the rating cannot be less than that of the stairway enclosure.



Exit Passageway Termination Section 1024.4

- Exit passageways located on the level of exit discharge shall be continuous until reaching the exit discharge.
- Where located on other levels of the building, exit passageways shall terminate at an exit, such as an interior exit stairway.



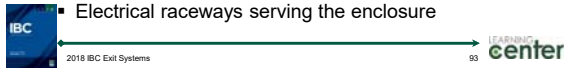
Exit Passageway Openings Section 1024.5

- Openings are limited in exit passageways in much the same manner as for interior exit stairways.
- Other than those in the exterior wall, openings are limited to those necessary for exit access to the exit passageway from normally occupied spaces, and for egress from the exit passageway.
 - Exception for mall buildings



Exit Passageway Penetrations Section 1024.6

- Penetrations are also limited in exit passageways in much the same manner as for interior exit stairways.
- Generally prohibited, allowances include:
 - Equipment and ductwork necessary for independent ventilation or pressurization
 - Fire protection systems
 - Security systems
 - Two-way communication systems
 - Electrical raceways serving the enclosure



Exit Passageway Ventilation Section 1024.7

- Equipment and ductwork necessary for independent pressurization is permitted where compliant with one of three established methods.
 - Although not specifically addressed, exit passageway ventilation must also comply with one of the three methods.
- Exit passageway ventilation systems shall be independent of other building ventilation systems.



Standpipes Section 1024.8

- Standpipes and standpipe hose connections, where mandated by Section 905.3, are to be located as required by Section 905.4.
 - In every exit passageway, a connection is required at the entrance from the exit passageway to other areas of the building
 - An exception addresses reachable floor areas adjacent to the exit passageway



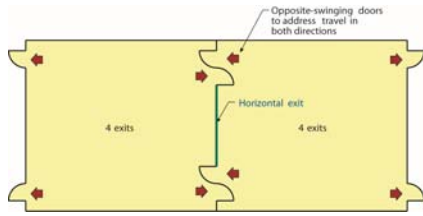
Horizontal Exits Section 1026.1

- Horizontal exits, while permitted as exit elements, address egress differently than the other exit components.
- One or more refuge areas are created to allow occupants protection from the area of fire incidence.
- Occupants then utilize the exit system provided for the other building occupants if continued egress is necessary.



Horizontal Exits Section 1026.1

- A refuge area can be created on one or both sides of the horizontal exit.



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Horizontal Exits Section 1026.1

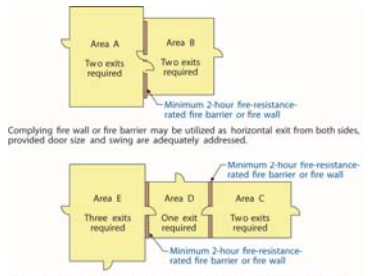
- Due to the concept of relocation rather than evacuation, all exits from a space or story cannot be horizontal exits.
- A horizontal exit cannot be the only exit from a portion of the building.
- If two or more means of egress are required, a limit of 50 percent of the total number, capacity and width are permitted to be horizontal exits.



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Horizontal Exits Section 1026.1



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When two or more exits are required, not more than one-half the total number of exits and one-half of the exit width may be horizontal exits.

Horizontal exit shall not serve as the only exit from an area.

Horizontal Exits Section 1026.1, Exceptions

- The limit on the number and width of horizontal exits is modified for:
 - Group I-2 occupancies, where up to 2/3 of the required exits can be horizontal exits
 - Group I-3 occupancies where all of the exits are permitted to be horizontal exits
 - Minimum of 6 sf of accessible space per occupant provided on each side of horizontal exit based on total number of people in adjoining compartments



Horizontal Exit Separation Section 1026.2

- A horizontal exit separation can be provided through two different methods:
 - Minimum 2-hour fire wall, or
 - Minimum 2-hour fire barriers



Horizontal Exit Fire Walls Section 1026.2

- The fire wall shall comply with Section 706.
- Fire door assemblies shall meet the base requirements for use in a fire wall:
 - Fire-protection-rated glazing is permitted as vision panels where limited to 100 square inches
- Glazed openings permitted where fire-resistance-rated.
- Duct and air transfer openings to be protected by both fire dampers and smoke dampers.



Horizontal Exit Fire Barriers Section 1026.2

- Where fire barriers are used, they shall extend vertically through all levels of the building.
 - Continuous vertical separation is not required where minimum 2-hour floor assemblies are provided with no unprotected openings.
- Horizontal exits constructed by fire barriers shall be continuous from exterior wall to exterior wall to completely divide the floor served by the horizontal exit.



Horizontal Exit Fire Barriers Section 1026.2

- The fire barriers shall comply with Section 707.
- Horizontal assemblies, where required, shall comply with Section 711.
- Fire door assemblies as required for fire barriers:
 - Fire-protection-rated glazing is permitted as vision panels where limited to 100 square inches
- Glazed openings permitted if fire-resistance-rated.
- Duct and air transfer openings to be protected by both fire dampers and smoke dampers.



Horizontal Exit Opening Protectives Section 1026.3

- Fire doors in a horizontal exit shall be self-closing or automatic-closing when activated by a smoke detector.
- Where located in a cross-corridor condition, the doors must be automatic-closing by activation of a smoke detector.



Refuge Area Section 1026.4

- In addition to enclosure by a fire-resistive separation, the size of the refuge area must be adequate for the occupant load served.
- It shall be a space occupied by the same tenant or a public area open to all occupants.
- The available floor area shall be such that it can accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment.

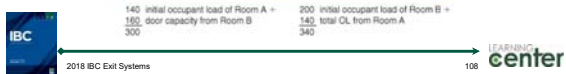
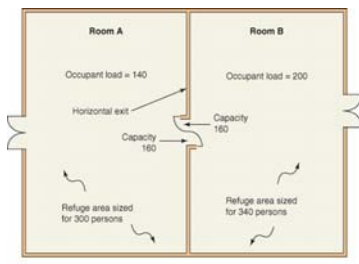


Refuge Area Section 1026.4

- The “anticipated” occupant load shall be based on the lesser of:
 - The capacity of the horizontal exit doors entering the refuge area, or
 - The total occupant load of the adjoining compartment.



Refuge Area Section 1026.4



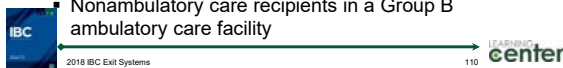
Capacity of Refuge Area Section 1026.4.1

- The capacity of the refuge area is determined based on a net floor area allowance of 3 square feet per occupant, except where the horizontal exit also forms a smoke compartment.
 - In such cases, the specific provisions for Group I-1, I-2, I-3 and Group B ambulatory care occupancies apply.



Capacity of Refuge Area Section 1026.4.1

- 6 square feet per occupant:
 - Group I-2 care recipients not confined to beds
 - Group I-3 occupants
 - Group I-1, Condition 2 occupants other than care recipients
- 15 square feet per occupant
 - Group I-1, Condition 2 care recipients
- 30 square feet per occupant
 - Group I-2 care recipients confined to beds
- Nonambulatory care recipients in a Group B ambulatory care facility



Number of Exits Section 1026.4.2

- The refuge area shall be provided with exits based on its original occupant load without adding the occupant load imposed by persons entering it through horizontal exits from other areas.
- At least one exit shall lead directly to the exterior or to an interior exit stairway or ramp.
 - Exception where refuge area has direct egress and no travel back through original compartment.



Number of Exits Section 1026.4.2

Refuge area of at least 555 sf, based on $(165+20) \times 3$ sf/occ

Office 20 occupants

Assembly room 320 occupants

Horizontal exit

33" of clear width provides an egress capacity of 165 (33" x 0.20)

Sprinklered building

Exiting based upon 20 occupants

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Standpipes Section 1026.5

- Standpipes and standpipe hose connections, where mandated by Section 905.3, are to be located as required by Section 905.4.
 - On each side of the wall adjacent to the exit door in the horizontal exit
 - An exception addresses reachable floor areas adjacent to the exit passageway

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Exterior Exit Stairways and Ramps Section 1027.2

- Exterior exit stairways and ramps are considered as exit components and are permitted as an element of the means of egress, except for:
 - Group I-2 occupancies
 - Buildings more than six stories above grade plane
 - High-rise buildings.

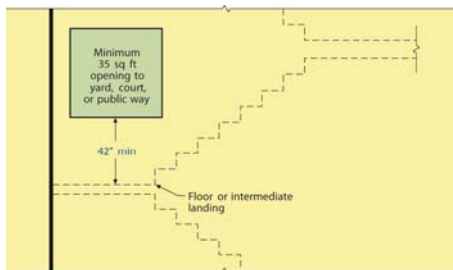
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Exterior Exit Stairway Open Side Section 1027.3

- Where exterior exit stairways and ramps are part of the means of egress, they shall be open on at least one side.
- The open side shall have an adjacent aggregate open area of 35 square feet at each floor level and intermediate landing level.
- The open area must be at least 42 inches above the adjacent floor or landing level.

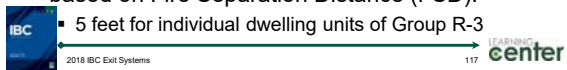


Exterior Exit Stairway Open Side Section 1027.3



Exterior Exit Stairway Location Section 1027.5

- At least 10 feet of horizontal separation shall be provided between an exterior exit stairway/ramp and:
 - Adjacent lot lines
 - Other portions of the same building
 - Other buildings on the same lot.
- The 10-foot minimum separation is not required where exterior walls and openings of the adjacent building are protected per Section 705 based on Fire Separation Distance (FSD).
- 5 feet for individual dwelling units of Group R-3



Exterior Exit Stairway Protection Section 1027.6

- In a general sense, exterior exit stairways and ramps must be separated from the interior of the building in the same manner as for interior exit stairways and ramps.
- Openings within the separation walls are limited to those doors necessary for egress from normally occupied spaces.



Exterior Exit Stairway Protection Section 1027.6



Exterior Exit Stairway Protection Section 1027.6, Exception 1

- An exterior exit stairway does not need to be separated from the interior of the building in buildings no more than two stories above grade plane.
 - This allowance is not applicable to Group R-1 and R-2 occupancies.

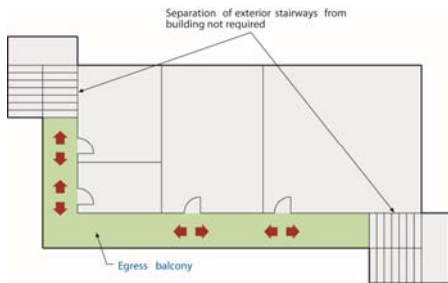


Exterior Exit Stairway Protection Section 1027.6, Exception 2

- An exterior exit stairway does not need to be separated from the interior of the building where two remote exterior stairways or other approved open-to-the-air exits are provided.
 - 50 percent openness is required
 - Top of openings to be not less than 7 feet above the top of the balcony



Exterior Exit Stairway Protection Section 1027.6, Exception 2



Exterior Exit Stairway Protection Section 1027.6, Exception 3

- An exterior exit stairway does not need to be separated from the interior of the building where it connects to open-ended corridors under the conditions of Section 1027.6, Exception 3.
- This building configuration is typically found where breezeways and similar building elements are used to serve each story.



Exterior Exit Stairway Protection Section 1027.6, Exception 3

For SI: 1 squarefoot = 0.093 m², 1 degree = 0.017 rad.

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Exterior Exit Stairway Protection Section 1027.6, Exception 4

- Exterior exit stairways/ramps serving Group R-3 occupancies no more than four stories in height need not be separated from the interior of the building.

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Module 4
Exit Discharge

Exit Discharge Section 1028

- The “exit discharge” is the third and final part of the means of egress system.
- With limited exception, exit discharge is exterior egress travel at grade between the building and the public way.
- Although it is the least hazardous portion of the means of egress process, the exit discharge is regulated to a limited degree.

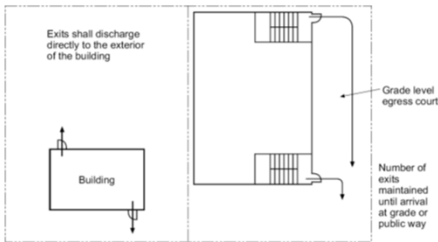


Exit Discharge Section 1028.1

- Exits shall discharge directly to the exterior of the building.
- The exit discharge shall be at grade or provide a direct path of egress travel to grade.
- The exit discharge shall not reenter a building.
- The required number of exits shall be maintained until arrival at the exit discharge.
 - Once reaching the exit discharge, multiple exits are no longer mandated.



Exit Discharge Section 1028.1

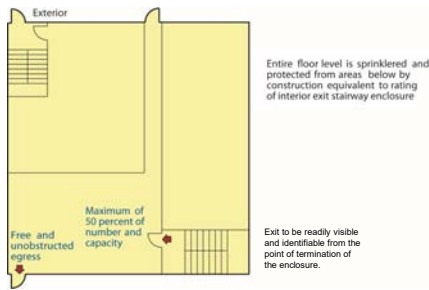


Interior Exit Discharge Section 1028.1

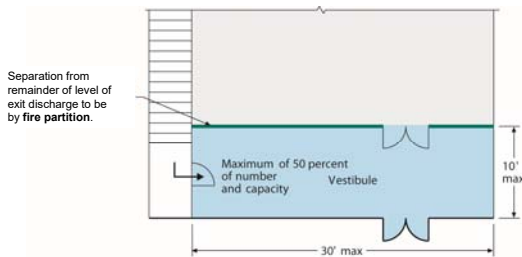
- While exit discharge typically occurs at the exterior of the building, there are two exceptions that permit interior exit discharge.
- The combined use of the two exceptions cannot exceed 50 percent of the number and capacity of the required exits.



Interior Exit Discharge Section 1028.1, Exception 1



Interior Exit Discharge Section 1028.1, Exception 2



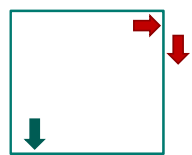
Exit Discharge Section 1028

- There are four key issues regarding the regulation of the exit discharge:
 - Capacity/width
 - Openness
 - Construction
 - Access to public way



Exit Discharge Capacity Section 1028.2

- Of primary importance, the capacity of the exit discharge cannot be less than the required discharge capacity of the exits being served.



Public Way



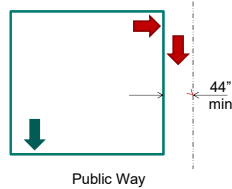
Exit Discharge Openness Section 1028.3

- Exit discharge components must be open to the exterior.
- Performance-wise, the exitway must be sufficiently open so that the accumulation of smoke and toxic gases is minimized.
- Throughout the code, the life-safety hazard level is greatly reduced where smoke and toxic gases are controlled or removed.



Exit Discharge Width Section 1028.4.1

- The minimum capacity of egress courts shall be based upon the capacity, but not less than 44 inches (36 inches for Group R-3).
- The minimum height shall be 7 feet.
- Width shall not be less than the required capacity.

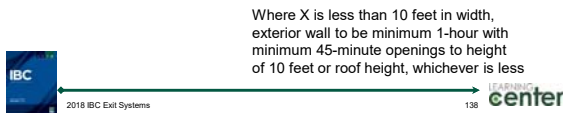
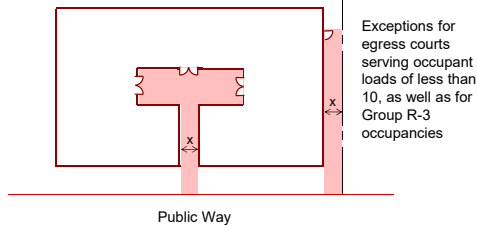


Exit Discharge Construction Section 1028.4.2

- Where the exit discharge is located such that egress travel must occur in close proximity to the building, the building's exterior wall and openings are regulated for fire-resistance and fire protectives.
- Egress courts adjacent to the building must allow for an efficient and protected path of travel to the public way.



Exit Discharge Construction Section 1028.4.2



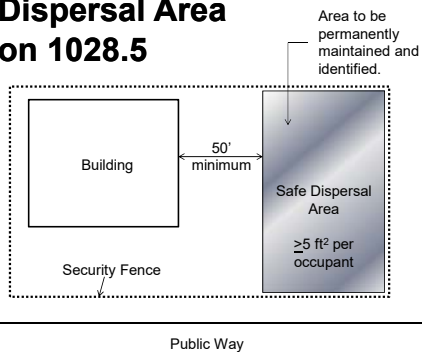
Where X is less than 10 feet in width, exterior wall to be minimum 1-hour with minimum 45-minute openings to height of 10 feet or roof height, whichever is less

Access to a Public Way Section 1028.5

- The exit discharge shall provide a direct and unobstructed path of travel to the public way.
 - A public way is “a street, alley or other parcel of land that has been deeded, dedicated, or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than 10 feet.”
- Where access to a public way cannot be provided, a safe dispersal area can be provided.



Safe Dispersal Area Section 1028.5



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