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CODE CORNER

ABOUT CODE CORNER

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CHAPTER 10

Means of Egress

General Comments

The general criteria set forth in Chapter 10 regulating the design of the means of egress are established as the primary method for protection of people in buildings. Chapter 10 provides the minimum requirements for means of egress in all buildings and structures. Both prescriptive and performance language is utilized in this chapter to provide for a basic approach in the determination of a safe exiting system for all occupancies. It addresses all portions of the egress system and includes design requirements as well as provisions regulating individual components. The requirements detail the size, arrangement, number and protection of means of egress components. Functional and operational characteristics also are specified for the components that will permit their safe use without special knowledge or effort. A zonal approach to egress provides a general basis for the chapter's format through regulation of the exit access, exit and exit discharge portions of the means of egress. Section 1001 includes the administrative provisions. Section 1002 shows the definitions of terms that are primarily associated with Chapter 10. Sections 1003 through 1013 include general provisions that apply to all three components of a means of egress system: exit access, exit and exit discharge. The exit access requirements are in Sections 1014 through 1019, the exit requirements are in Sections 1020 through 1026 and the exit discharge requirements are in Section 1027. Section 1028 includes those means of egress requirements that are unique to

an assembly occupancy. Emergency escape and rescue opening requirements are in Section 1029. Section 1002 through 1029 are duplicated text from Chapter 10 of the International Building Code® (IBC®) and are fully applicable to new buildings constructed after adoption of the code. The code has one additional section at the end of the chapter dealing with maintenance of the means of egress (see commentary, Section 1001.3). For means of egress requirements in existing buildings, refer to Chapter 46 of the code or IBC Chapter 34.

The evolution of means of egress requirements has been influenced by lessons learned from real fire incidents. While contemporary fires may reinforce some of these lessons, one must view each incident as an opportunity to assess critically the safety and reasonability of current regulations. Cooperation among the developers of model codes and standards has resulted in agreement on many basic terms and concepts.

The text of the code, including this chapter, is consistent with these national uniformity efforts. National uniformity in an area such as means of egress has many benefits for the building official and other code users. At the top of the list are the lessons to be learned from experiences throughout the nation and the world, which can be reported in commonly used terminology and conditions that we can all relate to and clearly understand.

Purpose

A principal purpose of codes in general and building and fire codes in particular, is to safeguard life in the presence of a fire. Integral to this purpose is the path of egress travel for occupants to escape and avoid a fire. Means of egress can be considered the lifeline of a building. The principles on which means of egress are based and that form the fundamental criteria for requirements are to provide a means of egress system:

1. That will give occupants alternative paths of travel to a place of safety to avoid fire.
2. That will shelter occupants from fire and the products of combustion.
3. That will accommodate all occupants of a structure.
4. That is clear, unobstructed, well marked and illuminated and in which all components are under control of the user without requiring any tools, keys or special knowledge or effort.

History is marked with the loss of life from fire. Early as well as contemporary multiple fire fatalities can be traced to a compromise of one or more of the above principles. Life safety from fire is a matter of successfully evacuating or relocating the occupants of a building to a place of safety. As a result, life safety is a function of time: time for detection, time for notification and time for safe egress. The fire growth rate over a period of time is also a critical factor in addressing life safety. Other sections of the code, such as protection of vertical openings (Chapter 7), interior finish (Chapter 8), fire suppression and detection systems (Chapter 9) and numerous others, also have an impact on life safety. Chapter 10 addresses the issues related to the means available to relocate or evacuate building occupants.

SECTION 1001 ADMINISTRATION

1001.1 General. Buildings or portions thereof shall be provided with a means of egress system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof. Sections 1003 through 1029 shall apply to new construction. Section 1030 shall apply to existing buildings.

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the *International Residential Code*.

⚡ *The minimum requirements for means of egress are to be incorporated in all structures as specified in this chapter. Application would be effective on the date the code is adopted and placed into effect. The means of egress in an existing building that experiences a change of occupancy, such as from Group S-2 (storage) to A-3 (assembly), would require reevaluation for code compliance based on the new occupancy as stated in Chapter 34 of the IBC. Similarly, the means of egress in an existing occupancy of Group A-3 in which additional seating is to be provided, thereby increasing the occupant load, would require reevaluation for code compliance based on the increased occupant load. Fundamental to the level of life safety in any building, whether it is new or many years old, is the provision for an adequate egress system, and it is for that reason that Section 4604 (formerly Section 1027) is retroactively applicable to existing buildings that are not undergoing changes as regulated by Chapter 34 of the IBC. The means of egress in existing buildings must also be properly maintained in accordance with Section 1030 if the intended level of safety is to remain for the life of the building. Reflecting the correlation and compatibility that is a hallmark of the International Codes® (I-Codes®), the exception makes it clear that the means of egress in buildings that are within the scope of the International Residential Code® (IRC®) are to comply with those requirements instead of Chapter 10.*

1001.2 Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of *exits* or the capacity of the *means of egress* to less than required by this code.

⚡ *A fundamental concept in life safety design is that the means of egress system is to be constantly available throughout the life of a building. Any change in the building or its contents, either by physical reconstruction or alteration or by a change of occupancy, is cause to review the resulting egress system. As a minimum, a building's means of egress is to be continued*

as initially approved. If a building or portion thereof has a change of occupancy, the complete egress system is to be evaluated and approved for compliance with the current code requirements for new occupancies (see IBC Chapter 34). The means of egress in an existing building that experiences a change of occupancy, such as from Group S-2 (storage) to A-3 (assembly), would require reevaluation for code compliance based on the new occupancy. Similarly, the means of egress in an existing occupancy of Group A-3 in which additional seating is to be provided, thereby increasing the occupant load, would require reevaluation for code compliance based on the increased load. The temptation is to temporarily remove egress components or other fire protection or life safety features from service during an alteration or repair to or temporary occupancy of a building. During such times, a building is frequently more vulnerable to fire and the rapid spread of products of combustion. Either the occupants should not occupy those spaces where the means of egress has been compromised by the construction or the compensating fire safety features should be considered, which will provide equivalent safety for the occupants. It should be noted that occupants in adjacent areas may also require access to the egress facilities in the area under construction.

SECTION 1002 DEFINITIONS

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

⌘ *Definitions of terms can help in the understanding and application of the code requirements. The purpose for including these definitions in this chapter is to provide more convenient access to them without having to refer back to Chapter 2. These terms are also listed in Chapter 2 with a cross reference to this section. The use and application of all defined terms, including those defined herein, are set forth in Section 201.*

ACCESSIBLE MEANS OF EGRESS. A continuous and unobstructed way of egress travel from any accessible point in a building or facility to a *public way*.

⌘ *Accessible means of egress requirements are*

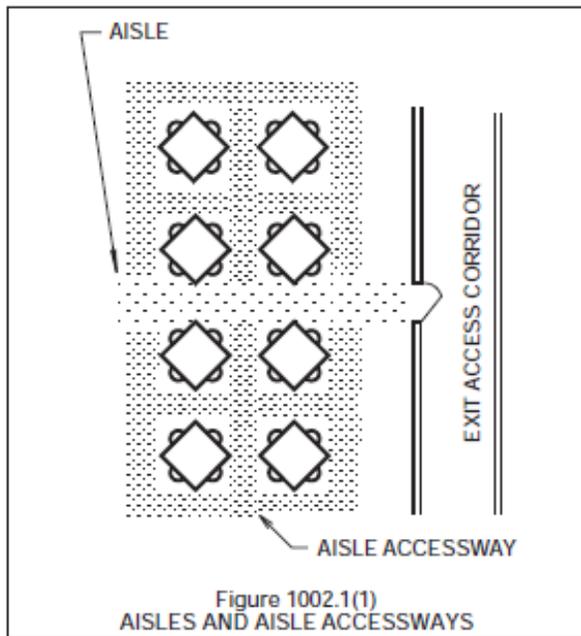
needed to provide those persons with physical disabilities or mobility impairments a means of egress to exit the building. Because of physical limitations, some occupants may need assistance to exit a building. See Section 1007 for requirements establishing areas where people can safely wait for assisted rescue. Chapter 4 also includes requirements in the fire safety and evacuation plans for specific planning to address occupants who may need assistance in evacuation during emergencies. Additionally, Chapter 9 of the code includes requirements for emergency evacuation notification for persons with hearing and vision disabilities. The accessible means of egress requirements may not be the same route as that required for ingress into the building (see Sections 1104 and 1105 of the IBC). For example, a two-story building requires one accessible route to connect all accessible spaces within the building. The accessible route to the second level is typically by an elevator. During a fire emergency, persons with mobility impairments on the second level would be moving to the exit stairways for assisted rescue, not back the way they came in, via the elevator.

AISLE. An unenclosed *exit access* component that defines and provides a path of egress travel.

⌘ *Aisles and aisle accessways are both utilized as part of the means of egress in facilities where tables, seats, displays or other furniture may limit the path of travel. The aisle accessways lead to the main aisles that lead to the exits from the space and building [see Figure 1002.1(1)]. While both may result in a confined path of travel, an aisle is an unenclosed component, while a corridor would be an enclosed component of the means of egress. See Sections 1017 and 1028 for requirements for aisles.*

AISLE ACCESSWAY. That portion of an *exit access* that leads to an *aisle*.

⌘ *As illustrated in Figure 1002.1(1), an aisle accessway is intended for one-way travel or limited two-way travel. The space between tables, seats, displays or other furniture (i.e., aisle accessway) utilized for means of egress will lead to a main aisle. See Sections 1017 and 1028 for requirements for aisle accessways.*



ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

⚡ *An alternating tread device is commonly used in areas that would otherwise be provided with a ladder where there is not adequate space for a full stairway. Where these devices are permitted is specifically listed (i.e., Section 1015.3). The device is used extensively in industrial facilities for worker access to platforms or equipment. Requirements are found with stairways in Section 1009.*

AREA OF REFUGE. An area where persons unable to use stairways can remain temporarily to await instructions or assistance during emergency evacuation.

⚡ *The area of refuge is a temporary waiting area used during emergency evacuations for persons who are unable to exit the building using the stairways. The fire safety plans (in accordance with Section 404 of the code) include the locations of areas of refuge so that the fire department will know where people may be waiting for rescue as-*

sistance. See Section 1007 for where areas of refuge are required at stairways and elevators. Areas of refuge have requirements for separation, size, signage, instructional information and two-way communication systems.

BLEACHERS. Tiered seating supported on a dedicated structural system and two or more rows high and is not a building element (see "Grandstands").

⚡ *Bleachers, folding and telescopic seating and grandstands are essentially unique forms of tiered seating that are supported on a dedicated structural system. All types are addressed in ICC 300, Standard on Bleachers, Folding and Telescopic Seating and Grandstands, the safety standard for these types of seating arrangements. Bleachers often do not have backrests. The travel path across the bleachers is not restricted to designated rows, aisles and aisle accessways. Without backrests, occupants can traverse from row to row without traveling to the designated egress aisles (see Section 1028.1.1). The term "Building element" is defined in Section 702.1 of the IBC. An individual bench seat directly attached to a floor system is not a bleacher. The terms "bleacher" and "grandstand" are basically interchangeable. There is no cut-off in size or number of seats that separates bleachers and grandstands.*

COMMON PATH OF EGRESS TRAVEL. That portion of exit access which the occupants are required to traverse before two separate and distinct paths of egress travel to two exits are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted travel distance.

⚡ *The common path of egress travel is a concept used to refine travel distance criteria. A common path of travel is the route an occupant will travel where the only way in is also the only way out, similar to a dead-end corridor. The length of a common path of egress travel is limited so that the means of egress path of travel provides a choice before the occupant has traveled an excessive distance (see Section 1014.3). This reduces the possibility that, although the exits are remote from one another, a single fire condition will render both paths unavailable.*

CORRIDOR. An enclosed exit access component that defines and provides a path of egress travel to an exit.

✧ *Corridors are regulated in the code because they serve as principal elements of travel in many means of egress systems within buildings. Typically, corridors have walls that extend from the floor to the ceiling. They need not extend above the ceiling or have doors in their openings unless a fire-resistance rating is required (see Section 1018). While both aisles and corridors may result in a confined path of travel, an aisle is an unenclosed component, while a corridor would be an enclosed component of the means of egress. The enclosed character of the corridor restricts the sensory perception of the user. A fire located on the other side of the corridor wall, for example, may not be as readily seen, heard or smelled by the occupants traveling through the egress corridor. The code does not specifically state what is considered “enclosed” when corridors are not fire-resistance rated. When an egress path is bounded by partial-height walls, such as workstation partitions in an office, issues would be if the walls provided a confined path of travel and limited fire recognition in adjacent spaces by restricting line of sight, hearing and smell.*

DOOR, BALANCED. A door equipped with double-pivoted hardware so designed as to cause a semi-counter balanced swing action when opening.

✧ *Balanced doors are commonly used to decrease the force necessary to open the door or to reduce the length of the door swing. Balanced doors typically reduce the clear opening width more than normally hinged doors [see Figure 1002.1(2) and Section 1008.1.10.2].*

EGRESSCOURT. A court or yard which provides access to a public way for one or more exits.

✧ *The egress court requirements address situations where the exit discharge portion of the means of egress passes through confined areas near the building and therefore faces a hazard not normally found in the exit discharge (see Section 1027.5).*

EMERGENCY ESCAPE AND RESCUE OPENING. An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

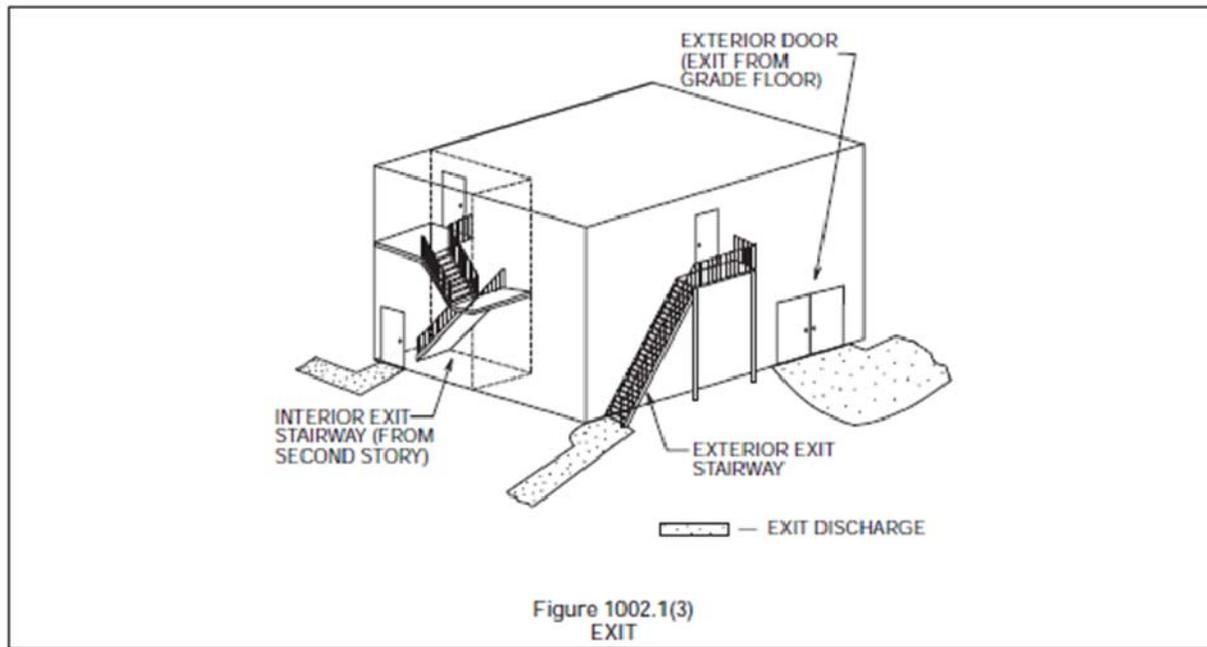
✧ *These are commonly windows that are sized and located such that they can be used to exit a building directly from a basement or bedroom during an emergency condition. The openings are also used by emergency personnel to rescue the occupants in a building (see Section 1029). They are never considered to be exit or exit access components for purposes of meeting minimum number of exit requirements.*

EXIT. That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include exterior exit doors at the level of exit discharge, vertical exit enclosures, exit passageways, exterior exit stairways, exterior exit ramps and horizontal exits.

✧ *Exits are the critical element of the means of egress system that the building occupants travel through to reach the exterior at the level of exit discharge. Exit stairways and ramps from upper and lower stories must be separated from adjacent areas with fire-resistance rated construction. The fire-resistance-rated construction serves as a barrier between the fire and the means of egress and protects the occupants while they travel through the exit. Separation by fire-resistance-rated construction is not required, however, where the exit leads directly to the exterior at the level of exit discharge (e.g., exterior door at grade). Figure 1002.1(3) illustrates three different types of exits: interior exit stairway, exterior exit stairway and exterior exit door. A horizontal exit, while not discharging to the outside, does discharge to another building or refuge area. The door to the refuge area is through a fire wall or fire barrier (see the definition for “Exit, horizontal” and Section 1025).*

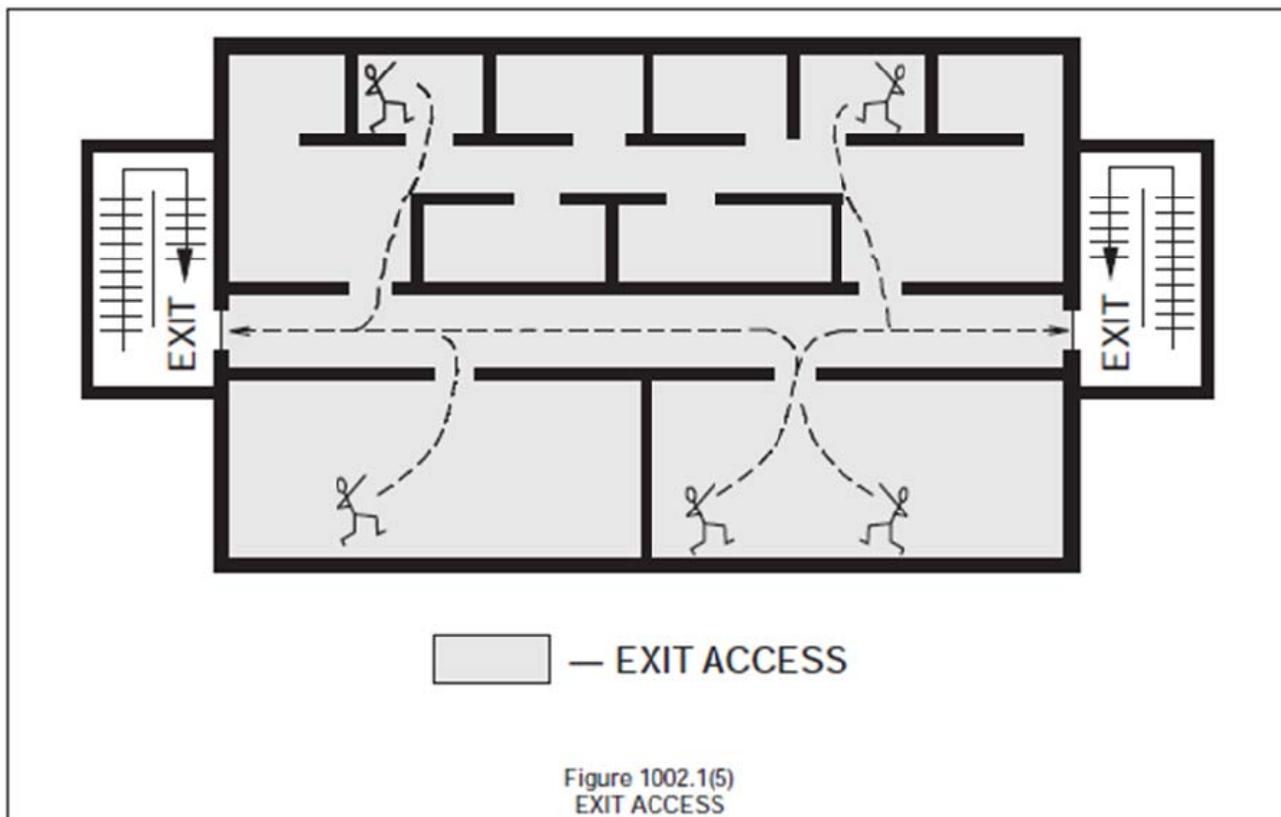
EXIT ACCESS. That portion of a means of egress system that leads from any occupied portion of a building or structure to an exit.

✧ *The exit access portion of the means of egress consists of all floor areas that lead from usable spaces within the building to the exit or exits serving that floor area. Crawl spaces and concealed attic and roof spaces are not considered to be part of the exit access. As shown in Figure 1002.1(5), the exit access begins at the furthest points within each room or space and ends at the entrance to the exit.*



EXIT ACCESS DOORWAY. A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, unenclosed exit access stair or unenclosed exit access ramp.

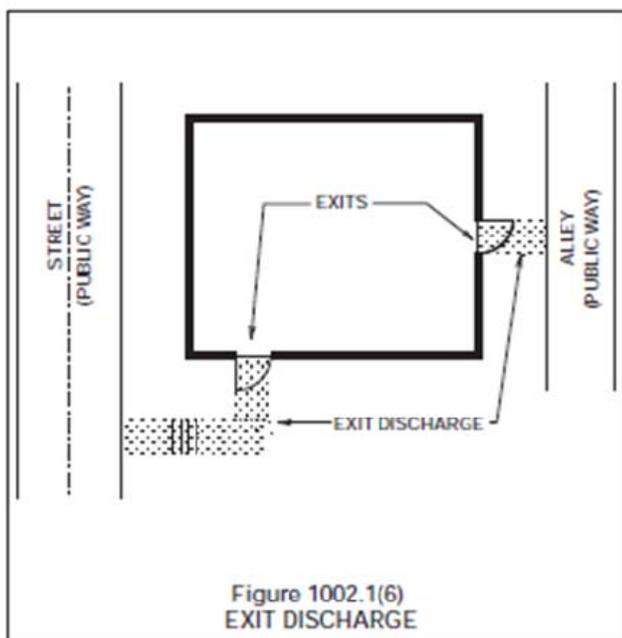
∩ Exit access doorways are used to design many critical aspects of the means of egress including arrangement, number, separation, opening protection and exit sign placement. The term “doorway” has traditionally been limited to those situations where an ac-



tual opening, either with or without a door, is present. With "access point" the term "exit access doorway" is inclusive of specific points in the means of egress which may not include a "door" such as when an unenclosed exit access stairway is used in the egress path (see Section 1016.1, Exceptions 3 and 4).

EXIT DISCHARGE. That portion of a means of egress system between the termination of an exit and a public way.

∩ The exit discharge will typically begin when the building occupants reach the exterior at or very near grade level. It provides occupants with a path of travel away from the building. All components between the building and the public way are considered to be the exit discharge, regardless of the distance. In areas of sloping terrain, it is possible to have steps or stairs in the exit discharge leading to the public way. The exit discharge is part of the means of egress and, therefore, its components are subject to the requirements of the code [see Figures 1002.1(3) and 1002.1(6) and Section 1027].



EXIT DISCHARGE, LEVEL OF. The story at the point at which an exit terminates and an exit discharge begins.

∩ The term is intended to describe the story where

the transition from exit to exit discharge occurs. At this level, the occupant needs only to move in a substantially horizontal path to move along exit discharge [see Figure 1002.1(7)]. Since the level is a volume rather than a horizontal plane, exterior exit steps may be part of the exit discharge when they provide access to the level that is closest to grade.

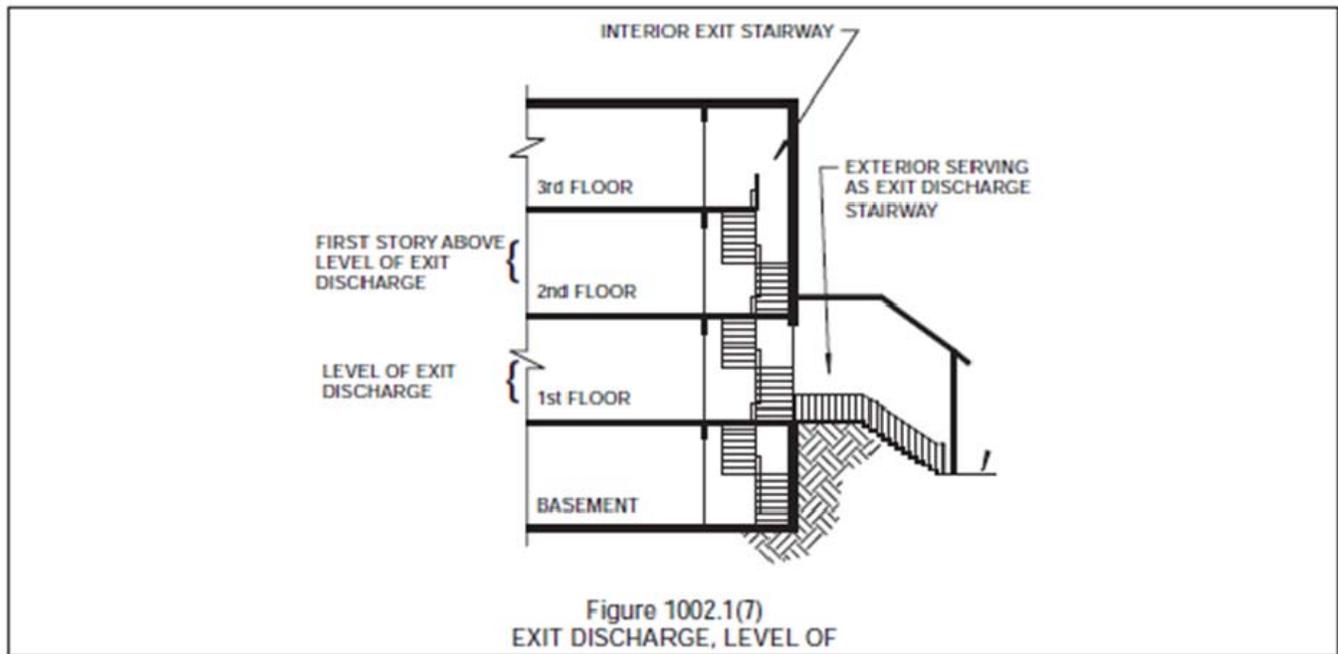
EXIT ENCLOSURE. An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a vertical or horizontal direction to the exit discharge or the public way.

∩ This term is used to describe an exit that is within a fire-resistance-rated enclosure for a generally vertical path of travel (e.g., a stairway or ramp) or a generally horizontal path of travel (e.g., exit passageway) (see Sections 1022 and 1023).

EXIT, HORIZONTAL. A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.

∩ This term refers to a fire-resistance-rated wall that subdivides a structure into multiple compartments and provides an effective barrier to protect occupants from a fire condition within one of the compartments. After occupants pass through a horizontal exit, they must be provided not only with sufficient space to gather but also with another exit, such as an exterior door or exit stairway, through which they can exit the building. Figure 1002.1(4) depicts the exits serving a single building that is subdivided with a fire-resistance-rated wall (see Section 1025).

EXIT PASSAGEWAY. 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 the exit discharge or the public way.



∞ This term refers to a horizontal portion of the means of egress that serves as an exit element. Since an exit passageway is considered an exit element, it must be protected and separated as required by the code for exits (see Section 1023). Exit passageways between a vertical exit enclosure and an exterior exit door are typically found on the level of exit discharge to provide a protected path from a centrally located exit stairway to the exit discharge. In taller buildings

that reduce floor sizes as they move up (sometimes called a wedding cake building), exit passageways may be utilized at "transfer floors" as stairway locations shift to move the vertical shafts in as the floor size decreases. Exit passageways that lead to an exterior exit door are commonly used in malls to satisfy the travel distance in buildings having a large floor area.

