

407.5.4

Required Egress from Smoke Compartments

CHANGE TYPE: Modification

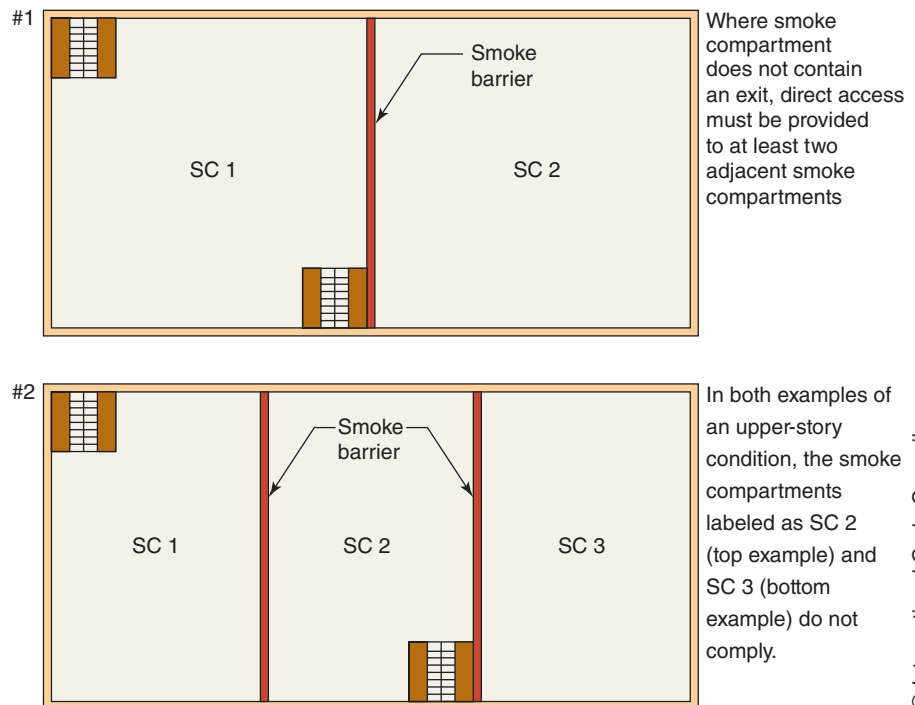
CHANGE SUMMARY: In Group I-2 occupancies, any smoke compartment that does not have an exit from the compartment must now provide direct access to a minimum of two adjacent smoke compartments.

2018 CODE: 407.5.2 407.5.4 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated. Smoke compartments that do not contain an exit shall be provided with direct access to not less than two adjacent smoke compartments.

CHANGE SIGNIFICANCE: In protect-in-place uses, such as hospitals and nursing homes, it is necessary to provide multiple smoke compartments to allow for movement of patients during fires and other emergency events. Previously, the only limiting requirement for a means of egress system from a smoke compartment was that the egress path could not return through the compartment of origin. An additional condition now indicates that any smoke compartment not having an exit must provide direct access to a minimum of two adjacent compartments.

Where there is no exit, such as a horizontal exit, interior exit stairway or exterior door at grade level, directly from a smoke compartment, the resulting condition creates somewhat of a “dead-end smoke compartment.” The IBC is now consistent with federal Medicare requirements in regard to the recognition of two alternative approaches to the design of the means of egress from a smoke compartment. Each compartment must be provided with a minimum of one direct exit, or direct access to at least two smoke compartments is required.

Noncompliant Examples:



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Egress from smoke compartments

CHANGE TYPE: Modification

CHANGE SUMMARY: The installation, inspection, testing, and maintenance of aerosol fire-extinguishing systems are now addressed through applicable references to Sections 901 and 904.4 of the IBC and NFPA 2010, as well as the system's listing and manufacturer's instructions.

2018 CODE: **904.14 Aerosol Fire-extinguishing Systems.** Aerosol fire-extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with Sections 901 and 904.4, NFPA 2010, and in accordance with their listing.

Such devices and appurtenances shall be listed and installed in conformance with manufacturer's instructions.

CHANGE SIGNIFICANCE: NFPA 2010 *Standard for Fixed Aerosol Fire Extinguishing Systems* was first published in 2006. Since then, the International Code Council Evaluation Service (ICC-ES) has published the ICC-ES Acceptance Criteria for Fixed Condensed Aerosol Fire-Extinguishing Systems, AC432. In 2014, the ICC-ES published evaluation report ESR-3230 for an aerosol fire-extinguishing system in compliance with the 2009 and 2012 editions of the IFC as an alternative to IFC Section 904.9, Halon Fire-extinguishing Systems. The IBC now addresses the installation, inspection, testing, and maintenance of aerosol fire-extinguishing systems through applicable references to Sections 901 and 904.4 of the IBC and NFPA 2010, as well as the system's listing and manufacturer's instructions.

Condensed aerosol fire-suppression systems used as total flooding systems for the protection of Class A (surface), Class B, and Class C hazards can reduce construction, installation, and maintenance costs compared with existing fire-extinguishing systems. This technology does not use compressed gas cylinders nor pressure-rated piping. Generally, these systems are electrically operated when integrated with approved fire alarm and releasing control systems and releasing panels, or are deployed as automatic stand-alone fire-extinguishing units.

As there are no piping distribution systems required, no special storage requirements for compressed gas bottles and the ability of the flooding agent to protect areas with limited leakage, the construction costs for these systems are typically lower than for conventional chemical and gas fire-extinguishing systems requiring gas pressure.

The technology remains effective even with leakage in the space, and therefore offers an alternative technology for installations involving reconstruction, or new construction in areas with special hazards, or where total room integrity construction is problematic.

904.14

Aerosol Fire Extinguishing Systems

Photo courtesy of Fireaway Inc.



Electrically-operated aerosol fire-extinguishing device

CHANGE TYPE: Modification

CHANGE SUMMARY: The permitted location for low-level exit signs selectively required in Group R-1 occupancies has been expanded to now allow the bottom of such sign to be mounted up to 18 inches above the floor.

2018 CODE: 1013.2 Floor-level Low-level exit signs in Group R-1.

Where exit signs are required in Group R-1 occupancies by Section 1013.1, additional low-level exit signs shall be provided in all areas serving guest rooms in Group R-1 occupancies and shall comply with Section 1013.5.

The bottom of the sign shall be not less than 10 inches (254 mm) nor more than ~~12 inches (305 mm)~~ 18 inches (455 mm) above the floor level. The sign shall be flush mounted to the door or wall. Where mounted on the wall, the edge of the sign shall be within 4 inches (102 mm) of the door frame on the latch side.

CHANGE SIGNIFICANCE: To help guide occupants of Group R-1 guest rooms to the exits during emergency conditions, additional exit signs are required within the egress system serving the guest rooms. Limiting the application to the egress system serving the guest rooms of hotels and other Group R-1 occupancies recognizes the transient nature of building's use, the often-delayed response to emergency conditions, and the typical low ceiling height in the corridors.

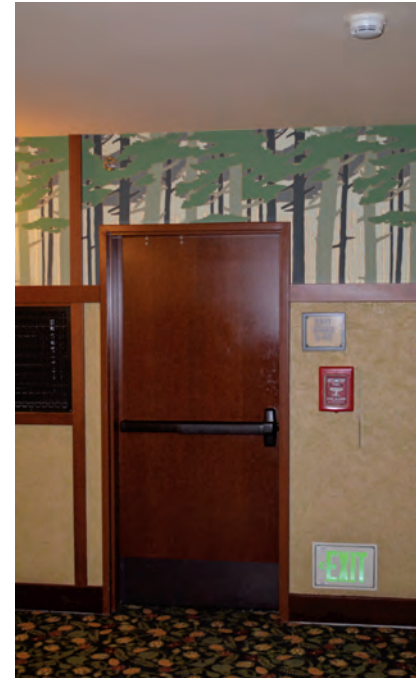
In the 2015 IBC, only a 2-inch tolerance was established for where the bottom of required low-level exit signs must be located. This 2-inch allowance was often challenging for designers and property owners due to field conditions or desired interior finish and trim. For example, several high-end resort properties have installed 12-inch-tall base boards in the exit access corridors of their hotels. The requirement for the bottom of the sign to be located within 10 to 12 inches above the floor level creates issues for these and similar facilities.

The bottom of the required low-level exit signs is now permitted to be located between 10 and 18 inches of the floor level. The additional 6 inches now available provides sufficient flexibility for designers and owners without adversely impacting the level of life safety of the occupants of the Group R-1 occupancies because the low-level exit signs will still be visible below the smoke layer from a fire (in the zone in which the occupants would presumably be crawling).

NFPA 101 *Life Safety Code* Section 7.10.1.6 permits the bottom of low-level exit signs to be installed between 6 and 18 inches above the floor level. Therefore, there is another life safety standard that permits the bottom of low-level exit signs to be installed up to 18 inches above the floor level. Although NFPA 101 permits the bottom of the low-level exit signs to be just 6 inches above the floor level, the IBC retains the requirement for a minimum of 10 inches above the floor level because ICC A117.1 Section 404.2.9 requires door surfaces within 10 inches of the floor to be a smooth surface for the full width of the door. As low-level exit signs can be installed either on the wall or the door, it is important that the low-end limit be such that it does not conflict with accessibility requirements.

1013.2

Floor Level Exit Sign Location



Low-level exit sign

CHANGE TYPE: Modification

CHANGE SUMMARY: The requirement for consideration of a keyway in the sliding analysis of retaining walls has been deleted from Section 1807.2.

2018 CODE: 1807.2 Retaining walls. Retaining walls shall be designed in accordance with Sections 1807.2.1 through 1807.2.3.

1807.2.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. ~~Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, lateral soil pressures on both sides of the keyway shall be considered in the sliding analysis.~~

1807.2.2 Design lateral soil loads. Retaining walls shall be designed for the lateral soil loads set forth in Section 1610. For structures assigned to Seismic Design Category D, E, or F, the design of retaining walls supporting more than 6 feet (1829 mm) of backfill height shall incorporate the additional seismic lateral earth pressure in accordance with the geotechnical investigation where required in Section 1803.2.

CHANGE SIGNIFICANCE: The application of soil pressure on both sides of a keyway is a recent addition to the model codes, and has caused concern and opposition from the geotechnical engineering community. The keyway concept is in conflict with accepted engineering practice and the principles of soil mechanics. 2015 IBC language was vague and ambiguous with respect to lateral soil pressures on the keyway.

The application of “lateral earth pressures on both sides of the keyway” is commonly interpreted to require a deepening of the active soil pressure to the bottom of the keyway. Active soil pressure requires movement of the key, which is contrary to the intent of the provision.

As there has been ongoing confusion over the intent of consideration of lateral earth pressure on both sides of the keyway and confusion about the purpose of the keyway, in the 2018 IBC the requirement for a keyway is deleted. A keyway may still be used when designed using the principles of soil mechanics and accepted engineering practice.

New text in Section 1807.2.2 adds a pointer for the structural design of retaining walls to resist lateral loads identified in the geotechnical report. The new requirement provides coordination with the requirements of Section 1803.5.12, geotechnical investigations in Seismic Design Categories D, E, and F, for lateral earth pressure on retaining walls.

1807.2

Retaining Walls



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Retaining walls