

South Carolina Office of State Fire Marshal

SOUTH CAROLINA STATE FIRE

LUMINOUS EGRESS MARKINGS IN HIGH RISE BUILDINGS

Purpose: This document provides guidance to State and local fire and building code officials as to the requirements for luminous egress path markings in new and existing high-rise buildings in South Carolina. Compliance with these code sections will ensure a safe evacuation of residents during worst case conditions.

With the implementation of the 2015 International Building and Fire Codes on July 1, 2016, requirements for luminous egress path markings became retroactive to existing high-rise buildings [see IFC 1104.25, 1025]. It is now mandatory for new and existing high-rise residential and commercial buildings to install luminous egress signage and path markings in stairwells and landings.

Improved safety for individuals negotiating stairs during egress of a high-rise building is provided by improving the visibility of stair treads and handrails under emergency conditions. A second source of emergency power for exit illumination, exit signs, and stair shaft pressurization systems in smoke-proof enclosures is currently mandated for high-rise buildings. In the event of an emergency that disconnects utility power, the emergency power source should engage, causing the stair shaft to be illuminated and kept smoke free by the pressurization system. Unfortunately, such systems can fail under demand conditions.

The provisions of Section 1025 provide an additional level of safety to the egress path by requiring the installation of photo-luminescent or self-illuminating marking systems that do not require electrical power and its associated wiring and circuits. An additional means for ensuring occupants can safely egress a building via exit stairways is now available - even if the emergency power supply fails to operate. High-rise occupancies have a greater anticipated occupant load and occupants may not be as familiar with the space. Note these provisions only require markings within the enclosure for the exit stairway, exit ramp, and the exit passageway used for enclosure continuation. The markings are not required before reaching the exit (i.e., exit access) or after leaving the exit (i.e., exit discharge). If the exit stairway discharges through an exit passageway, the exit path markings must continue to the door leading to the outside. The current code does not address vestibules and horizontal exits, but since Sections 1025.1 through 1025.5 only address within the enclosure for the exit, and not the exit discharge, exit path markings in the vestibule or after the horizontal exit are not required.

Products utilized to meet the requirements for luminous egress path markings in high-rise buildings or exit signs may be photo-luminescent or self-luminous. An example of photo-luminescent material is paint or tape that is charged by exposure to light. When the lights are turned off, the product will “glow” in the dark. Self-luminous products do not need an outside light source to charge them like photo-luminescent materials.



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A variety of materials can comply with the referenced standards for egress path markings (UL 1994, and ASTM E2072) and for signs (UL 924). ASTM E2072 allows the use of paints and coatings, which can be useful because it avoids a potential tripping hazard, especially in locations where the surface substrate may not be even. The luminescence of the selected marking system must provide an illumination of one (1) footcandle (11 lux) for 60 minutes, which is consistent with the requirement in Section 1008.2 for the illumination of walking surfaces. Section 1008.3 requires the emergency lighting system to have power for 90 minutes; however, because of normal battery considerations, the IFC only requires a 60-minute duration in existing buildings.

Compliance with these code sections will ensure a safe evacuation of residents during worst case conditions. The failure to enforce this retroactive requirement risks the lives of occupants of high-rise buildings bringing liability on your jurisdiction and the building owner. Please find the attached illustrated guidance to assist you in applying these code sections.

If you have a question, please contact the S.C. Office of State Fire Marshal.



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2015 International Building and Fire Code

Luminous Egress Path Markings



SECTION 1025 LUMINOUS EGRESS PATH MARKINGS

1025.1 General.

Approved luminous egress path markings delineating the exit path shall be provided in high-rise buildings of Group A, B, E, I, M, and R-1 occupancies in accordance with Sections 1025.1 through 1025.5.

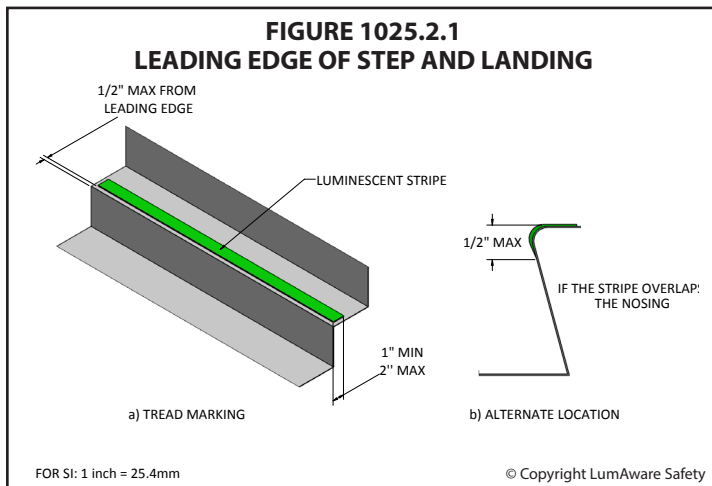
Exception: Luminous egress path markings shall not be required on the *level of exit discharge* in lobbies that serve as part of the *exit path* in accordance with Section 1028.1, Exception 1.

1025.2 Markings within exit components.

Egress path markings shall be provided in *interior exit stairways*, *interior exit ramps* and *exit passageways*, in accordance with Sections 1025.2.1 through 1025.2.6.

1025.2.1 Steps.

A solid and continuous stripe shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed not more than 1/2 inch (12.7 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than 1/2 inch (12.7 mm) down the vertical face of the step.



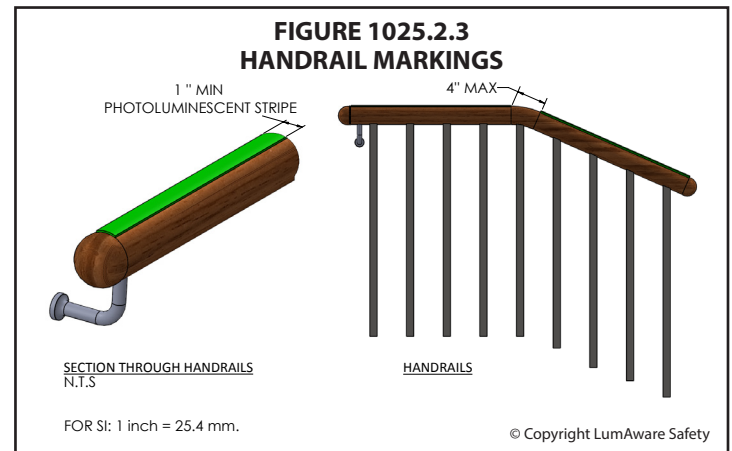
Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

1025.2.2 Landings.

The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.

1025.2.3 Handrails.

Handrails and *handrail* extensions shall be marked with a solid and continuous stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the *handrail* for the entire length of the *handrail*, including extensions and newel post caps. Where *handrails* or *handrail* extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).



Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

1025.2.4 Perimeter demarcation lines.

Stair landings and other floor areas within *interior exit stairways*, *interior exit ramps* and *exit passageways*, with the exception of the sides of steps, shall be provided with solid and continuous demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 to 2 inches (25 mm to 51 mm) wide with interruptions not exceeding 4 inches (102 mm).

Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

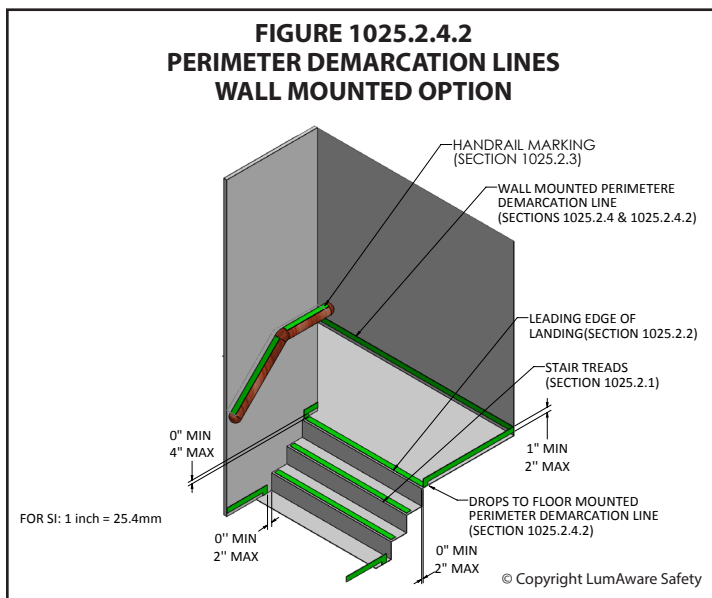
1025.2.4.1 Floor-mounted demarcation lines.

Perimeter demarcation lines shall be placed within 4 inches (102 mm) of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of *exit discharge* doors that lead out of an exit and through which occupants must travel to complete the exit path.

1025.2.4.2 Wall-mounted demarcation lines.

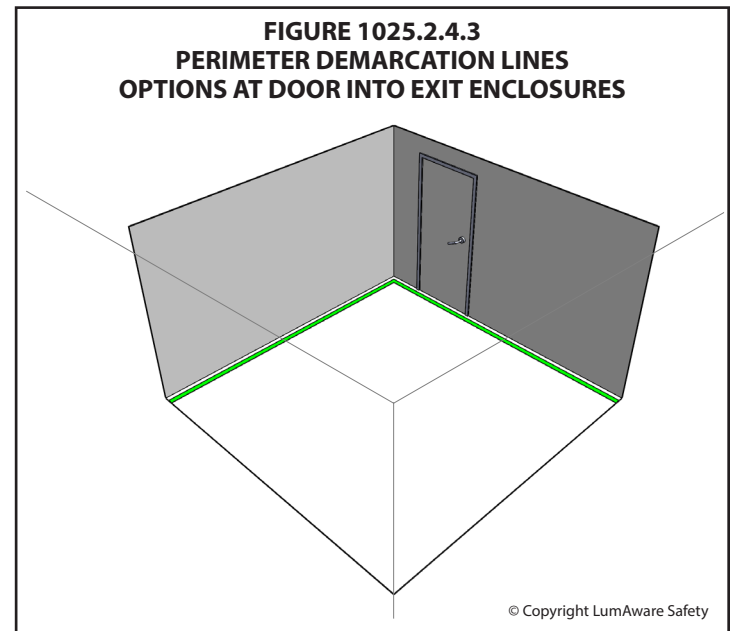
Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe not more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such door.



Exception: Demarcation lines shall not extend in front of *exit discharge* doors that lead out of an exit and through which occupants must travel to complete the exit path.

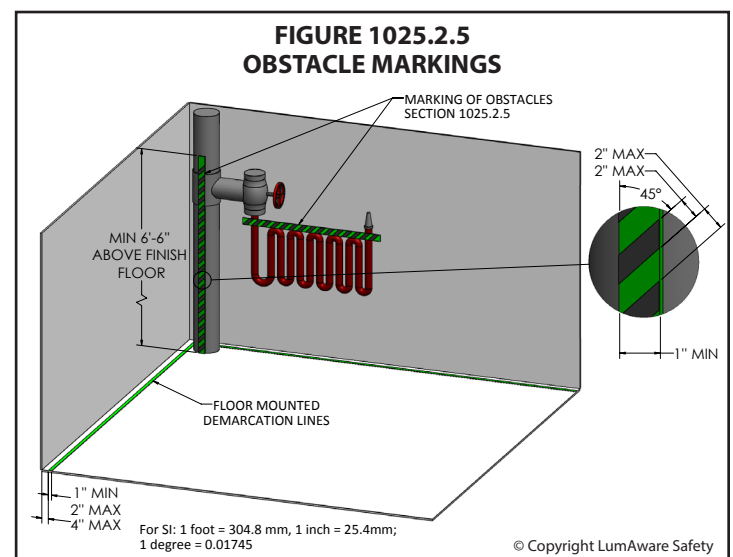
1025.2.4.3 Transition.

Where a wall-mounted demarcation line transitions to a floor-mounted demarcation line, or vice-versa, the wall-mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor-mounted demarcation line, thus forming a continuous marking.



[BE] 1025.2.5 Obstacles.

Obstacles at or below 6 feet 6 inches (1981 mm) in height and projecting more than 4 inches (102 mm) into the egress path shall be outlined with markings not less than 1 inch (25 mm) in width comprised of a pattern of alternating equal bands, of luminous material and black, with the alternating bands not more than 2 inches (51 mm) thick and angled at 45 degrees (0.79 rad). Obstacles shall include, but are not limited to, standpipes, hose cabinets, wall projections, and restricted height areas. However, such markings shall not conceal any required information or indicators including but not limited to instructions to occupants for the use of standpipes.



1025.2.6 Doors within the exit path.

Doors through which occupants must pass in order to complete the *exit* path shall be provided with markings complying with Sections 1025.2.6.1 through 1025.2.6.3.

1025.2.6.1 Emergency exit symbol.

The doors shall be identified by a low-location luminous emergency exit symbol complying with NFPA 170. The *exit* symbol shall be not less than 4 inches (102 mm) in height and shall be mounted on the door, centered horizontally, with the top of the symbol not higher than 18 inches (457 mm) above the finished floor.

1025.2.6.2 Door hardware markings.

Door hardware shall be marked with not less than 16 square inches (406 mm²) of luminous material. This marking shall be located behind, immediately adjacent to, or on the door handle or escutcheon. Where a panic bar is installed, such material shall be not less than 1 inch (25 mm) wide for the entire length of the actuating bar or touchpad.

1025.2.6.3 Door frame markings.

The top and sides of the door frame shall be marked with a solid and continuous 1-inch- to 2-inch-wide (25 mm to 51 mm) stripe. Where the door molding does not provide sufficient flat surface on which to locate the stripe, the stripe shall be permitted to be located on the wall surrounding the frame.

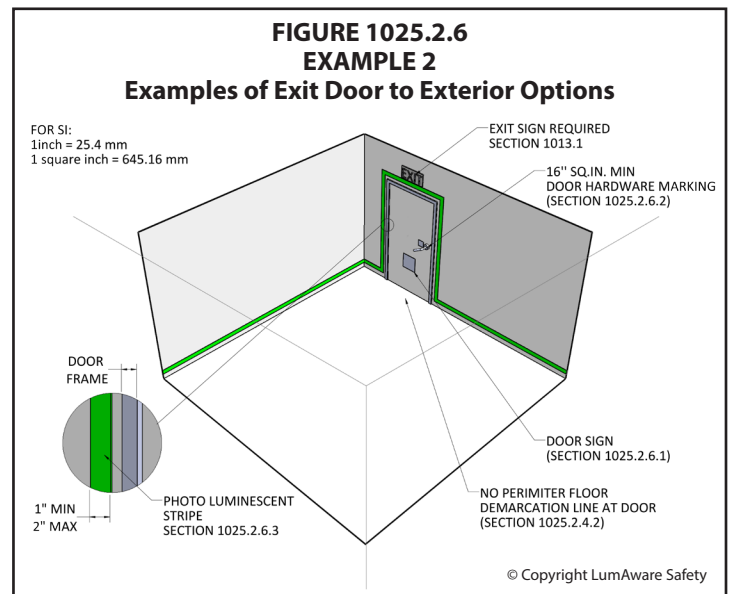
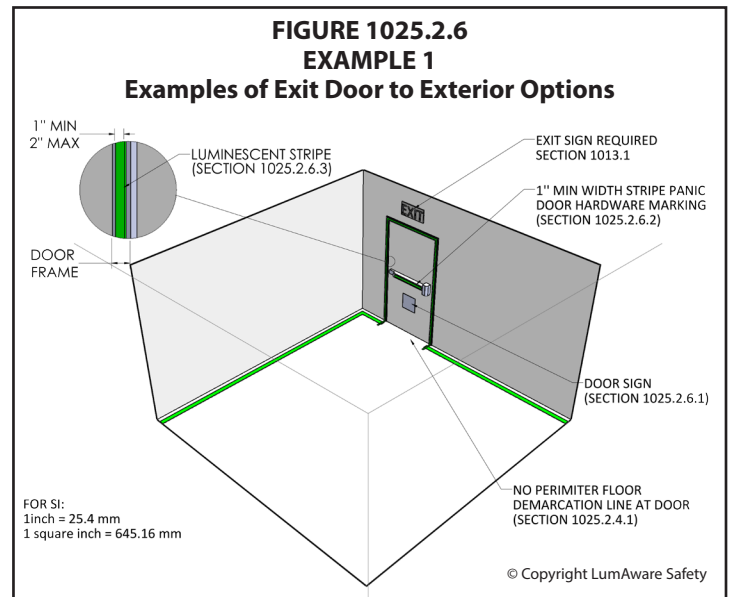
1025.3 Uniformity.

Placement and dimensions of markings shall be consistent and uniform throughout the same enclosure.

1025.4 Self-luminous and photoluminescent.

Luminous egress path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not be limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either of the following standards:

1. UL 1994.
2. ASTM E 2072, except that the charging source shall be 1 footcandle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 milicandelas per square meter at 10 minutes and 5 milicandelas per square meter after 90 minutes.



1025.5 Illumination.

Where photoluminescent *exit* path markings are installed, they shall be provided with not less than 1 footcandle (11 lux) of illumination for not less than 60 minutes prior to periods when the building is occupied and continuously during the building occupancy.

A sign shall be provided at each floor landing in an *interiorexit stairway* and *ramp* connecting more than three stories designating the floor level, the terminus of the top and bottom of the *interiorexit stairway* and *ramp* and the identification of the stairway or *ramp*. The signage shall also state the story of, and the direction to, the *exit discharge* and the availability of roof access from the *interiorexit stairway* and *ramp* for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. 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 at each floor-level landing adjacent to the door leading from the *interiorexit stairway* and *ramp* into the *corridor* to identify the floor level.

Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the *interiorexit stairway* and *ramp* shall be not less than 1-1/2 inches (38 mm) in height.
3. The number designating the floor level shall be a not less than 5 inches (127 mm) in height and located in the center of the sign.
4. Other lettering and numbers shall be not less than 1 inch (25 mm) in height.
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.
6. Where signs required by Section 1023.9 are installed in the *interiorexit stairways* and *ramps* of buildings subject to Section 1025, the signs shall be made of the same materials as required by Section 1025.4.

FIGURE 1023.9
STAIRWELL IDENTIFICATION SIGNS

The diagram illustrates the requirements for stairwell identification signs. On the left, a detailed view of a rectangular sign is shown. The sign has a green background and black text. The text reads "NORTH STAIR" and "NO ROOF ACCESS" at the top, a large number "5" in the center, and "EXIT ON LEVEL 1" at the bottom. Dimensions for the sign are provided: a width of 12 inches (305mm) and a height of 18 inches (457mm). Callouts point to the text, stating that letters designating the stairway and ramp identification must be at least 1 1/2 inches (38 mm) high, and that characters and background must be non-glare and high contrast. Another callout points to the number, stating it must be at least 5 inches (127mm) high. A final callout points to the background, stating it must be made of ASTM E 2027 photo luminescent material. On the right, a 3D perspective view shows the sign mounted on a wall next to a door. The sign's dimensions are repeated: 12 inches (1023.9.1) wide and 18 inches (1524mm) high (1023.9). The door is shown with a handle and a lock.

RAISED CHARACTERS AND BRAILLE AND COMPLYING WITH ICC A117.1

12" (305mm)

NORTH STAIR
NO ROOF ACCESS

5

EXIT ON LEVEL 1

18" (457mm)

THE LETTERS DESIGNATING THE IDENTIFICATION OF THE INTERIOR EXIT STAIRWAY AND RAMP SHALL BE NOT LESS THAN 1 1/2 INCHES (38 mm) IN HEIGHT

CHARACTERS AND BACKGROUND SHALL BE NON GLARE AND CONTRAST

12" 1023.9.1

18" (1524mm) 1023.9

5" (127mm)

NUMBER DESIGNATING FLOOR SHALL NOT BE LESS THAN 5" (127mm)

OTHER LETTERS SHALL NOT BE LESS THAN 1"

SIGN SHALL HAVE BACKGROUND MADE OF ASTM E 2027 PHOTO LUMINESCENT

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