AfterGlow®

Photoluminescent Safety Solutions®

Wherever You May Be

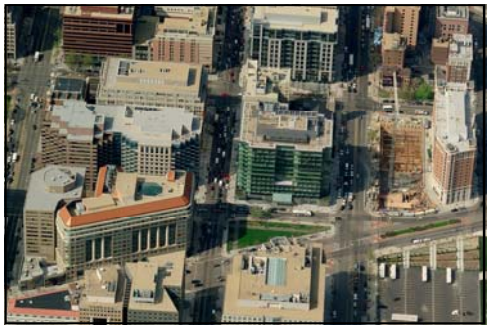
2011 AfterGlow® Emergency Egress Markings Reference Guide

We have installed our AfterGlo® and AfterGlow® Brand Low Location Exit Path Marking Systems in many locations...here is a small sample showing where our products are being used:

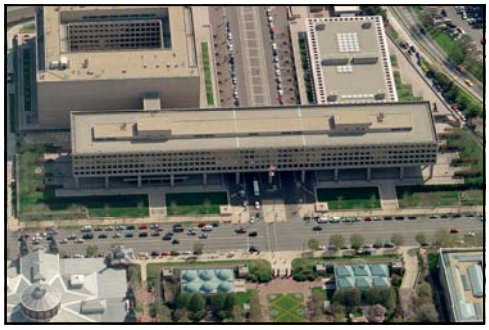
The Pentagon, Washington Headquarters Services

Eisenhower Executive Office Building

Bureau of Alcohol, Tobacco, Firearms and Explosives

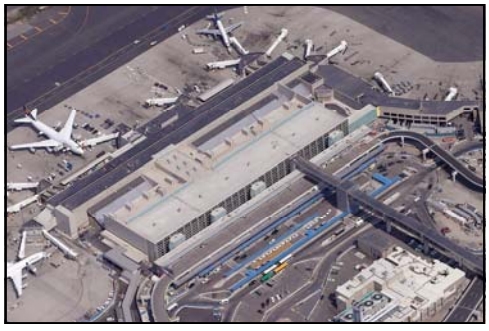


1101 New York Avenue, NW



U.S. Department of Energy Forrestal Building

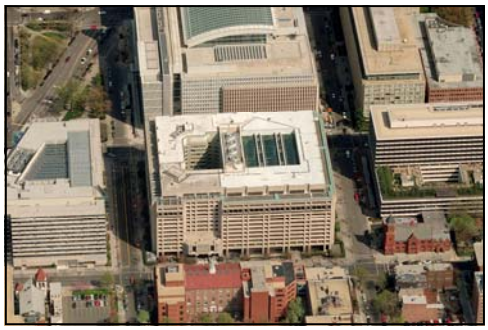
Federal Reserve System Eccles Building



Logan International Airport, Boston

Joint Spectrum Center, Defense Information Systems Agency

Boeing, National Reconnaissance Office



International Monetary Fund Headquarters

United States Naval Research Laboratory

Uniformed Services University of the Health Sciences

To see a more complete listing, please visit our website:

www.afterglowllc.com

What's in this Reference Guide (and where is it)?

Introduction

In 2009, the International Building Code (IBC), the International Fire Code (IFC) and the National Fire Protection Association (NFPA) 101 Life Safety Code were significantly revised. The revisions instituted new rules for means of exit path markings, safety markings, and anti-slip stair treatments. These revisions, combined with expanded interest in sustainable green building technologies, have raised many questions about what these revised standards and requirements really mean. Architects, engineers, developers, building owners, operators, maintenance managers and many other others are affected by the 2009 code provisions discussed herein.

The AfterGlow® Emergency Egress Markings Reference Guide was developed to serve as an all-in-one sourcebook for professionals seeking simple answers to many of these questions and attempts to address how both new construction and pre-existing buildings should be modified in order to comply with the 2009 provisions.[1]

This guide also addresses how AfterGlow® Brand Emergency Egress Markings can help earn credits for the Leadership in Energy and Environmental Design's (LEED®[2]) Green Building Rating System. LEED® certification procedures are addressed as well as incentives and cost-savings opportunities for using AfterGlow® Brand green emergency egress products.

The entire industry is affected by the 2009 code provisions, including:

- Building owners
- Developers
- Architects
- Engineers
- Maintenance managers
- Facility managers
- And others

About AfterGlow, LLC

One of the nation's leading providers of emergency egress products and solutions, AfterGlow, LLC® has significant experience in researching, developing, engineering, and manufacturing safety markings and egress equipment employing photoluminescent materials. For more information about the 2009 emergency egress code revisions, LEED® egress solutions or AfterGlow's emergency egress products, visit www.afterglowllc.com or call 1-877-AFT-GLOW (238-4569).

[1] This guide summarizes selected provisions from the 2009 IFC, IBC and NFPA 101 codes. The IFC, IBC and NFPA are the definitive sources for the complete requirements.
[2] LEED is a registered trademark of the U.S. Green Building Council.

2009 International Building Code and International Fire Code

In order to protect the health, safety and welfare of communities large and small, the industry adheres to a system of model codes that regulate the construction of residential and commercial buildings.

These codes are created by the International Code Council (ICC), a membership association dedicated to building safety and fire prevention. The International Building Code (IBC) and International Fire Code (IFC) are two of the most widely accepted codes in North America; all 50 states have adopted a version of the IBC and at least 42 states have adopted a version of the IFC.

To ensure the regulations remain up-to-date, the ICC revises the codes every three years to include new and innovative design ideas and technologies, modern materials and methods of construction, and current approaches to fire safety, life safety and structural stability. In 2009, the ICC introduced the latest editions of the IBC and IFC, both of which contained significant code changes and additions, particularly in regards to the means of egress.

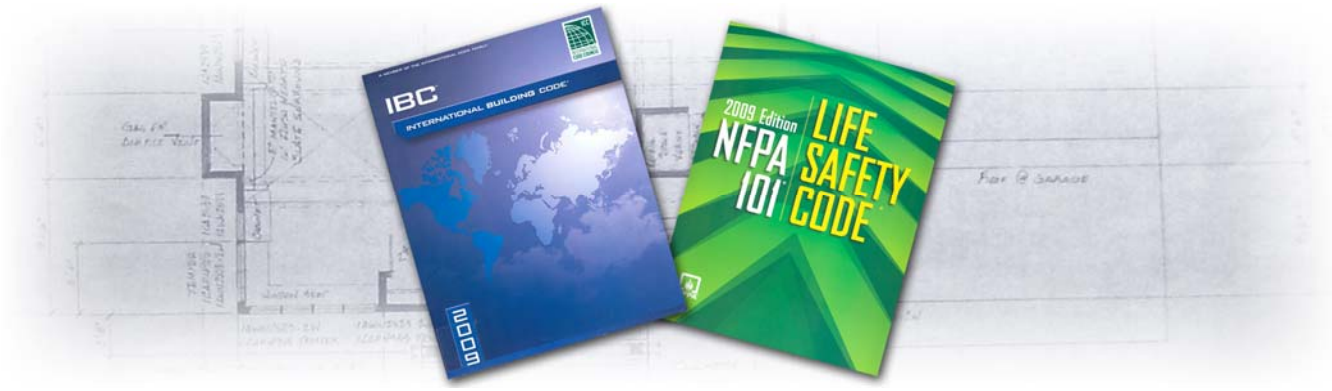
More than half of the states are expected to adopt the 2009 IBC code by 2010.

The 2009 IBC defines a means of egress 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: access to the exit, the exit itself, and the actual exit of the space.

IBC/IFC Egress Regulations:[3]

The 2009 IBC and IFC state that luminous egress path markings shall be required in all new and existing institutional, educational, business, hotel, public assembly and R-1 residential buildings having occupied floors that are located more than 75 feet above the lowest level of fire department vehicle access (generally at least 5 stories or floor levels). According to the tenth chapter of the IBC and IFC, luminous markings are required for all doors, steps, landings, handrails, perimeters, and obstacles.

The IBC and IFC regulations are enforced by building inspectors and fire code officials. Buildings are put on notice if they do not conform, and then given a reasonable amount of time to bring the facilities up to code. If they fail to meet regulations by the designated timeline, buildings are subject to fines and penalties. Additionally, the risk of liability exposure increases dramatically if an unfortunate incident occurs in a building that has not conformed to the required codes.



[3] This handbook highlights a selection of egress regulations from the 2009 IFC and 2009 IBC. For a complete list of provisions, consult with the IFC and IBC.

Examples of Affected Occupancy Groups:

- Assembly (A) (For Public Events)
- Business (B)
- Education (E)
- Hospitality/Hotels (R-1)
- Institutional/Hospital (I)
- Mercantile (M)
- Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including hotels, and boarding houses (R-1) motels

Exempted Occupancy Groups:

- Factory and Industrial
- High Hazard
- Utility
- Residential other than R-1

A

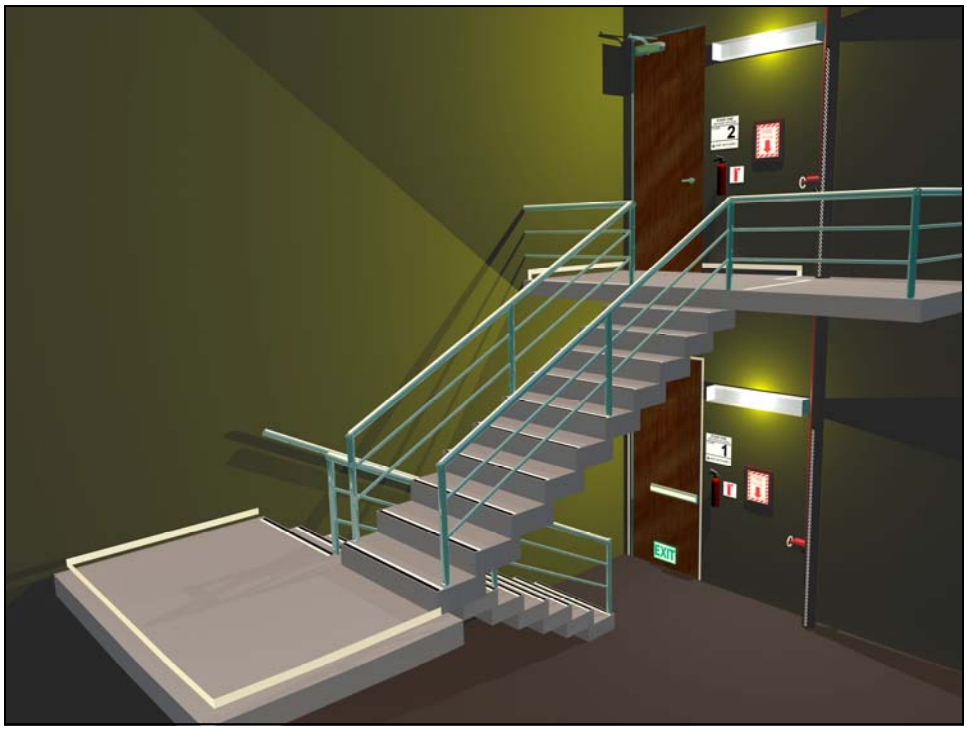
B

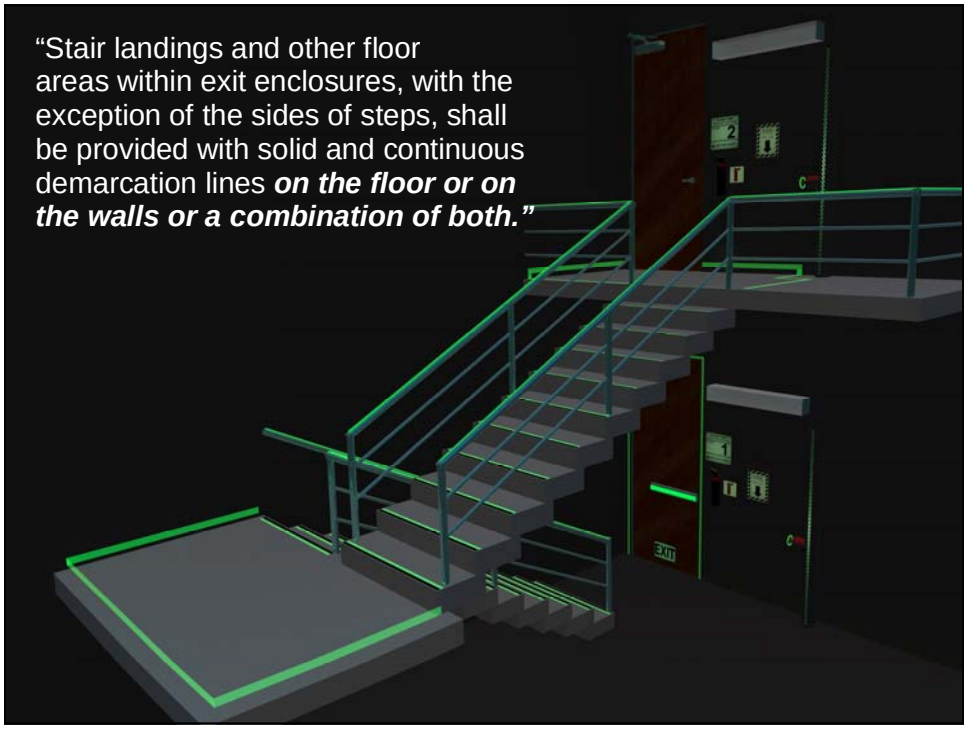
E

R-1

I

M





These stairwell diagrams provide an overview of the 2009 International Building Code and International Fire Code. Photographs of actual installations illustrating specific code requirements appear on the following pages.

Directional Signage (IBC Section 1007.10)

R6SNR0JGRE-N

Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. Within areas of refuge.

Exit Signs (IBC Section 1011)

Exit Signs (IBC Section 1011.1)

Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30,480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

BGL101BRRE-P

Exceptions:

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

Illumination (IBC Section 1011.2)

Exit signs must be internally or externally illuminated.

Exceptions: Tactile signs required by Section 1011.3 need not be provided with illumination.

Tactile Exit Signs (IBC Section 1011.3)

A tactile sign stating “EXIT” and complying with ICC A117.1 shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge.

Internally Illuminated Exit Signs (IBC Section 1011.4)

Electrically powered, self-luminous and photoluminescent exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer’s instructions and Chapter 27. Exit signs shall be illuminated at all times.

BPL101BGRE-P

Externally Illuminated Exit Signs (IBC Section 1011.5)
Externally illuminated exit signs shall comply with Sections 1011.5.1 through 1011.5.3

Power Source (IBC Section 1011.5.3)
Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

Exception:
Approved exit sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

Photoluminescent exit signs do not require any battery or electrical backup.

Actual photograph of photoluminescent exit signs installed in the Eisenhower Executive Office Building (EEOB), part of the White House Complex (Note: the integrity of the EEOB's historic fabric was maintained)

Floor Identification Signs (IBC Section 1022.8)

A sign shall be provided at each floor landing in exit enclosures connecting more than 3 stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and direction to, the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524mm) above the floor landing in a position that is readily visible when the doors are in the open or closed positions. Floor level identification signs in tactile characters complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

NFPA01JKRE-P

FF3330VRRE-P

FF3220VRRE-P

Signage Requirements (IBC Section 1022.8.1)
Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457mm) by 12 inches (305mm).
2. The letters designating the identification of the stair enclosure shall be a minimum of 1½ inches (38mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch (25mm) 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. When signs required by Section 1022.8 are installed in interior exit enclosures of buildings subject to Section 1024, the signs shall be made of the same materials as required by Section 1024.4.

Luminous Egress Path Markings (IBC Section 1024.1)

Approved luminous egress path markings delineating the exit path shall be provided in buildings of groups A, B, E, I, M and R-1 having occupied floors located more than 75 feet (22860 mm) above the lowest level of fire department vehicle access in accordance with Sections 1024.1 through 1024.5. (see page 5 for examples)

Egress Path Markings (IFC Section 4604.23)

Existing buildings of groups A, B, E, I, M and R-1 having occupied floors located more than 75 feet (22.9 m) above the lowest level of fire department vehicle access shall be provided with luminous egress path markings in accordance with Section 1024.

Path Markings within Exit Enclosures (IBC Section 1024.2)

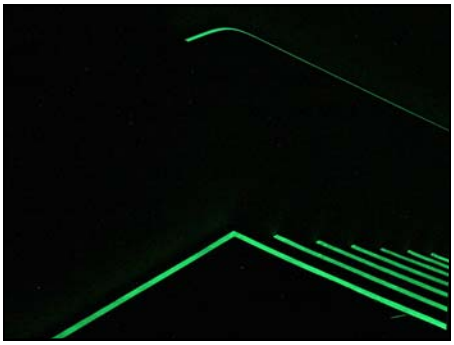
Egress path markings shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, in accordance with Sections 1024.2.1 through 1024.2.6.

Steps (IBC Section 1024.2.1)
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 (25mm) and a maximum width of 2 inches (51mm). The leading edge of a stripe shall be placed a maximum of ½ inch (13mm) from the leading edge of the step and the stripe shall overlap the leading edge of the step by not more than ½ inch (13mm) down the vertical face of the step.



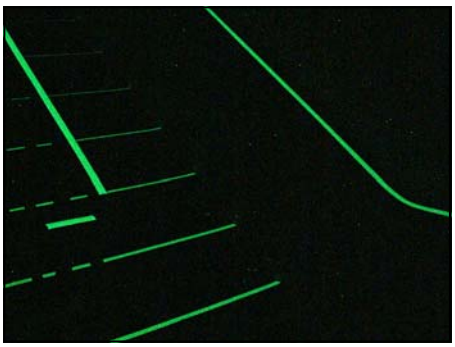
Landings (IBC Section 1024.2.2)
The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.





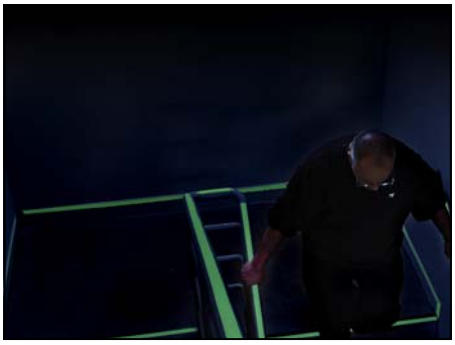
Handrails (IBC Section 1024.2.3)
All handrails and handrail extensions shall be marked with a solid and continuous stripe having a minimum width of 1” (25mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102mm).





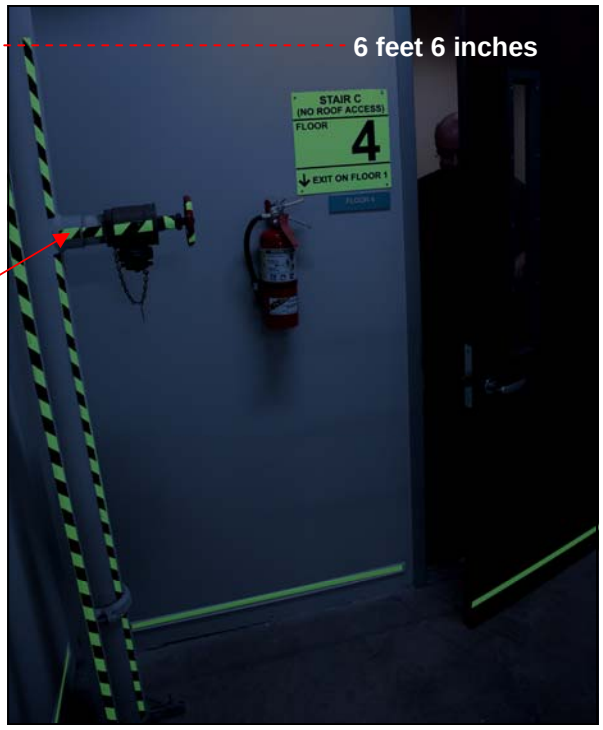
Perimeter Demarcation Lines (IBC Sections 1024.2.4)
Stair landings and other floor areas within exit enclosures, with the exception of the sides of steps, shall be provided with solid and continuous demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 to 2 inches (25mm to 51mm) wide with interruptions not exceeding 4 inches (102mm).

DS81A0VBRE-P



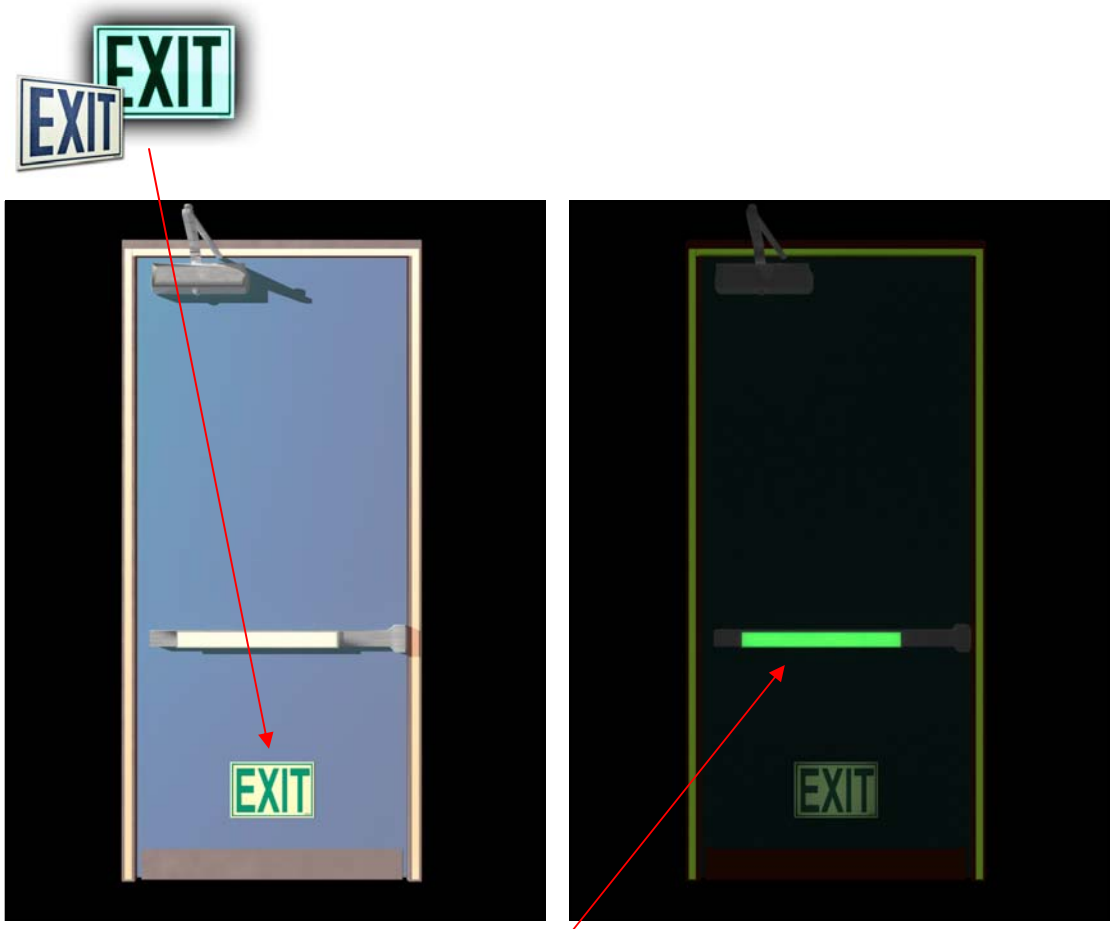
Obstacles (IBC Section 1024.2.5)
Obstacles at or below 6 feet 6 inches (1981mm) in height and projecting more than 4 inches (102mm) into the egress path shall be outlined with markings no less than 1 inch (25mm) in width comprised of a pattern of alternating equal bands, of luminescent luminous material and black, with the alternating bands no more than 2 inches (51mm) 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.

BS694BJGPE-P

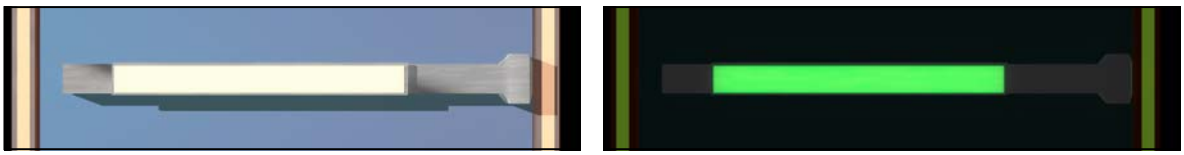


Doors from Exit Enclosures (IBC Section 1024.2.6)
Doors through which occupants within an exit enclosure must pass in order to complete the egress path shall be provided with markings complying with Sections 1024.2.6.1 through 1024.2.6.3.

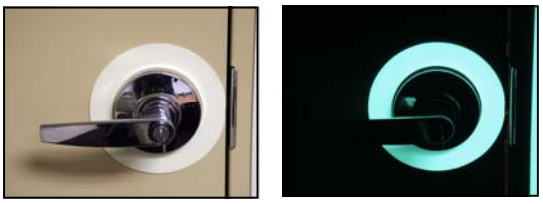
Emergency Exit Symbol (IBC Section 1024.2.6.1)
The doors shall be identified by a low-location luminous emergency exit symbol complying with NFPA 170. The exit symbol shall be a minimum of 4 inches (102mm) in height and shall be mounted on the door, centered horizontally, with the top of the symbol no higher than 18 inches (457mm) above the finished floor.



Door Hardware Markings (IBC Section 1024.2.6.2)
Door hardware shall be marked with no less than 16 square inches (406 mm^2) of luminous material. The marking shall be located behind, immediately adjacent to or on the door handle and/or escutcheon. Where a panic bar is installed, such material shall be no less than 1 inch (25mm) wide for the entire length of the actuating bar or touchpad.



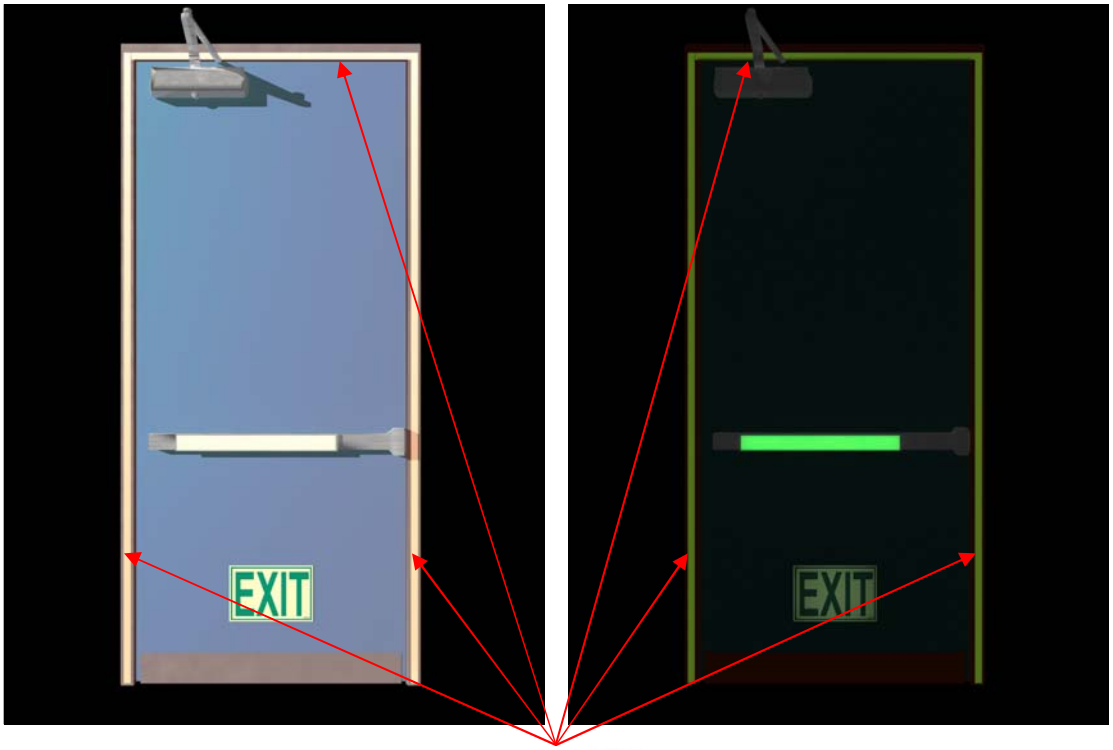
NLN132JBPE-Y



DKR200VBRE-P

Door Frame Markings (IBC Section 1024.2.6.3)

The top and sides of the door frame shall be marked with a solid and continuous 1 inch to 2 inch (25mm to 51mm) wide 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.



DS81A0VBRE-P

The 2009 IBC defines an exit enclosure 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 vertical or horizontal direction to the exit discharge or the public way.”

Path Marking Uniformity (IBC Section 1024.3)

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

Self-luminous and Photoluminescent Material (IBC Section 1024.4)

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 are not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994; or
2. ASTM E 2072, except that the charging source shall be 1 foot-candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 mcd/m^2 at 10 minutes and 5 mcd/m^2 after 90 minutes.

HPP012DGNK-P

DHi's High Performance Photoluminescent Safety Paint applied to a cinderblock

Illumination (IBC Section 1024.5)

Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

Illumination Required
The means of egress must be illuminated at all times the building space is occupied (Section 1006.1).

Illumination Level (IBC Section 1006.2)
The means of egress illumination level shall not be less than 1 foot-candle (11 lux) at the walking surface.

Other Important IBC Sections Impacting the 2009 Egress Regulations Include:*

Section 1006	Means of Egress Illumination	Section 1012	Handrails
Section 1008	Doors, Gates and Turnstiles	Section 1013	Guards
Section 1009	Stairways	Section 1022	Exit Enclosures

**While Chapter 10 of the 2009 IFC states that all the above regulations only apply to new building construction, Chapter 46 (section 4604.23) confirms that existing 75-foot and taller buildings of Groups A, B, E, I, M and R-1 must have the luminous egress path markings specified in Section 1024.*

IBC 2009 Glossary

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

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.

EXIT ACCESS – That portion of the means of egress system that leads from any occupied portion of a building or structure to an 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 DISCHARGE – That portion of the means of egress system between the termination of an exit and a public way.

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

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.

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.

MEANS OF EGRESS – 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.

PUBLIC WAY – A street, alley, or other parcel of land open to the outside air leading to a street, 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 (3048mm).

STAIRWAY – One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

EXTERIOR STAIRWAY – A stairway that is open on at least one side, except for the required structural columns, beams, handrails, and guards. The adjoining open areas shall be either yards, courts, or public ways. The other sides of the exterior stairway need not be open.

INTERIOR STAIRWAY – A stairway not meeting the definition of an exterior stairway.

2009 National Fire Protection Association 101: Life Safety Code

To protect the lives of building occupants in the event of a fire, the industry has established several construction codes and standards intended to minimize the possibility and effects of fire and other risks. These codes are created by the National Fire Protection Association (NFPA), identified as the world's largest and most influential fire safety organization.

The NFPA's Life Safety Code, also known as the NFPA 101, is another benchmark for occupant fire safety in both new and pre-existing structures. It provides advanced regulations for sprinklers, alarms, egress, emergency lighting, smoke barriers, special hazard protection, and other features required to reduce the loss of life from fire, including smoke, fumes, or panic.

Similar to the IBC and IFC, the NFPA 101 is updated every three years to include the latest research, technological advances and industry developments in relation to fire safety. The latest version of the NFPA 101, which was released in 2009, contains a number of significant provisions regarding the means of egress.

Virtually every building, process, service, design and installation in the industry today is affected by NFPA documents.

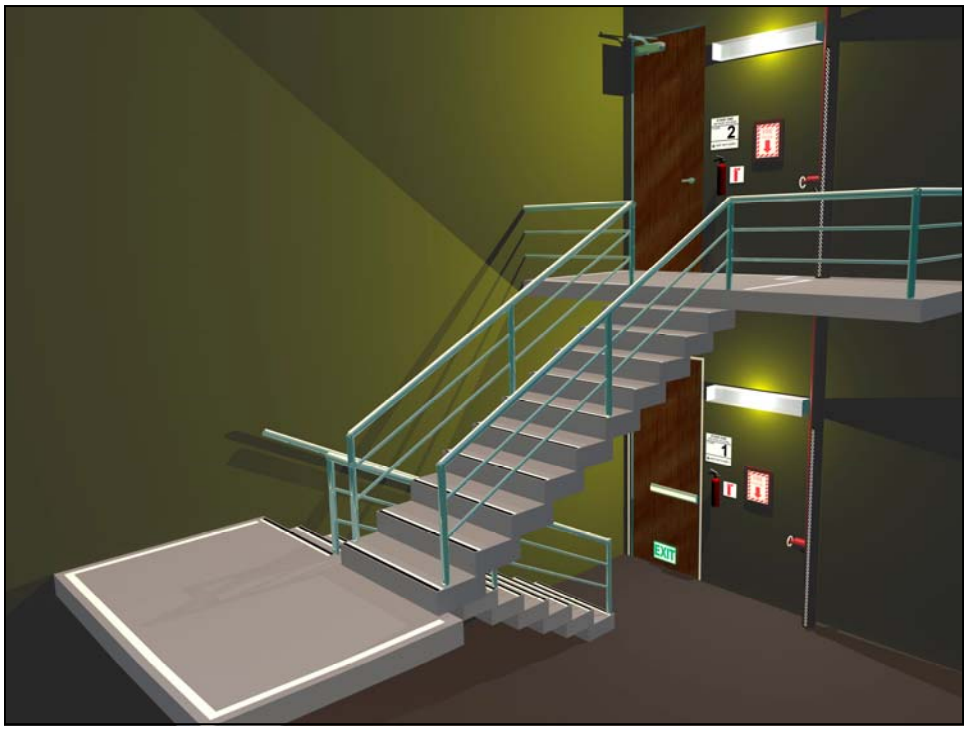
The Life Safety Code is one of 300 codes and standards created by the NFPA to minimize the possibility and effects of fire and other risks.

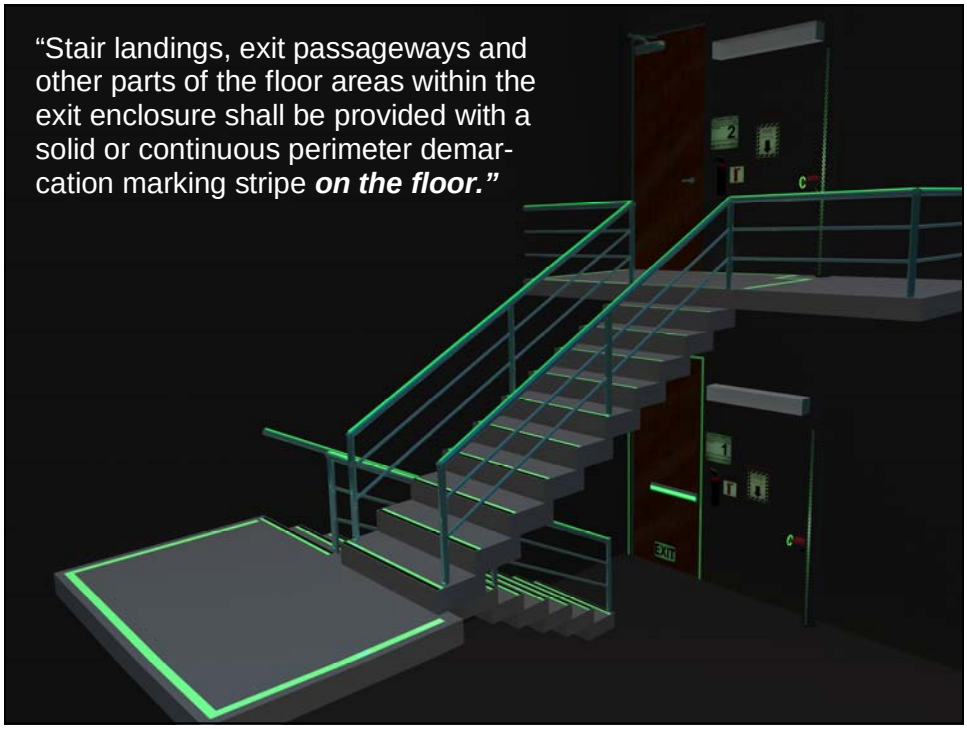
2009 NFPA 101 Egress Regulations[4]

The 2009 NFPA 101: Life Safety Code includes new criteria for the complete marking of steps, handrails and door hardware. Revised standards also apply for the remoteness of exit accesses and exit discharges, intended to reduce the possibility of both paths becoming blocked by a single fire.

The NFPA 101 is enforced by inspectors, zoning boards, fire marshals and other industry officials. **The code applies to existing structures as well as new structures.** When a code revision is adopted into local law, existing structures have a grace period before they must comply.

[4] This handbook highlights a selection of egress regulations from the 2009 NFPA 101 Life Safety Code. For a complete list of provisions, consult with the NFPA.





These stairwell diagrams provide an overview of the 2009 National Fire Protection Association 101: Life Safety Code. Photographs of actual installations illustrating specific code requirements appear on the following pages.

NFPA 101 Section 7.2 Means of Egress Components

Door Openings (NFPA 101 Section 7.2.1.5.7.3)

Signage on the stair door leaves shall be required as follows:

1. Door assemblies allowing re-entry shall be identified as such on the stair side of the door leaf.
2. Door assemblies not allowing re-entry shall be provided with a sign on the stair side indicating the location of the nearest door opening, in each direction of travel, that allows re-entry or exit.

7" x 9" Custom Sign
GPS001DMRE-P

7" x 12" Custom Sign
GPS001DMRE-P

Stairway Identification (NFPA 101 Section 7.2.2.5.4)

New enclosed stairs serving three or more stories and existing enclosed stairs serving five or more stories shall comply with Sections 7.2.2.5.4.1 - A through M.

A. The stairs shall be provided with special signage within the enclosure at each floor landing.
B. The signage shall indicate the floor level.
C. The signage shall indicate the terminus of the top and bottom of the stair enclosure.
D. The signage shall indicate the identification of the stair enclosure.
E. The signage shall indicate the floor level of, and the direction to, exit discharge.
F. The signage shall be located inside the enclosure approximately 60 inches (1525mm) above the floor landing in a position that is visible when the door is in the open or closed position.
G. The signage shall comply with 7.10.8.1 and 7.10.8.2 of this code.
H. The floor level designation shall also be tactile in accordance with ICC/ANSI A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
I. The signage shall be painted or stenciled on the wall or on a separate sign securely attached to the wall.
J. The stairway identification letter shall be located at the top of the sign in minimum 1 in. (25mm) high lettering and shall be in accordance with 7.10.8.2.
K. Signage that reads "NO ROOF ACCESS" and is located under the stairway identification letter shall designate stairways that do not provide roof access. Lettering shall be a minimum of 1 in. (25mm) high and shall be in accordance with 7.10.8.2.
L. The floor level number shall be located in the middle of the sign in minimum 5 in. (125mm) high numbers and shall be in accordance with 7.10.8.2. Mezzanine levels shall have the letter "M" or other appropriate identification letter preceding the floor number, while basement levels shall have the letter "B" or other appropriate identification letter preceding the floor level number.
M. Identification of the lower and upper terminus of the stairway shall be located at the bottom of the sign in minimum 1 in. (25mm) high letters or numbers and shall be in accordance with 7.10.8.2.

NFPA01JKRE-P

Stairway Tread Marking (NFPA 101 Section 7.2.2.5.4.3)

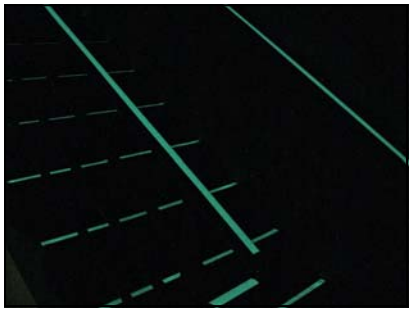
Where new contrasting marking is applied to stairs, such marking shall comply with the following:

A. The marking shall include a continuous strip as a coating on, or as a material integral with, the full width of the leading edge of each tread
B. The marking shall include a continuous strip as a coating on, or as a material integral with, the full width of the leading edge of each landing nosing.
C. The marking strip width, measured horizontally from the leading vertical edge of the nosing, shall be consistent at all nosings.
D. The marking strip width shall be 1 in. to 2 in. (25mm to 51mm).

NFPA 101 Section 7.2.2.5.4.4

Where new contrast marking is provided for stairway handrails, it shall be applied to, or be part of, at least the upper surface of the handrail; have a minimum width of ½ inch (13mm); and extend the full length of each handrail. After marking, the handrail must comply with 7.2.2.4.4.

NSSPL2JMPE-P



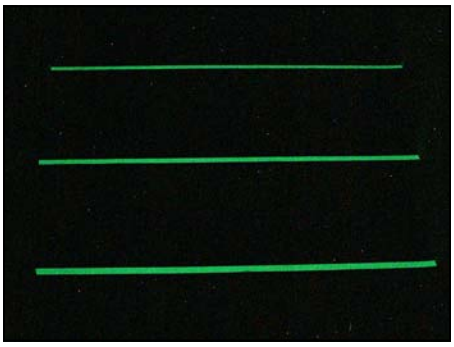
Exit Stair Path Markings (NFPA 101 Section 7.2.2.5.5)

Where exit stair path markings are required in Chapters 11-43, such markings shall be installed in accordance with 7.2.2.5.5.1 through 7.2.2.5.5.11.

Exit Stair Treads (NFPA 101 Section 7.2.2.5.5.1)

Exit stair treads must have a marking stripe applied as a paint/coating (or a material that is integral with the nosing of each step) along the step's horizontal leading edge throughout the full width of the step. The marking stripe must meet the following requirements:

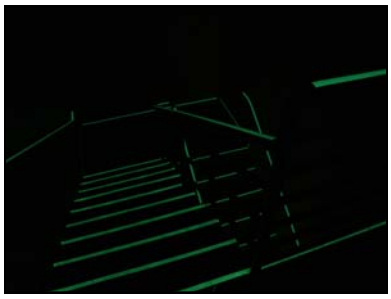
1. The marking stripe shall be not more than ½ in. (13mm) from the leading edge of each step and shall not overlap the leading edge of the step by more than ½ " (13mm) down the vertical face of the step.
2. The marking stripe shall have a minimum horizontal width of 1 inch (25mm) and a maximum width of 2 inches (51mm).
3. The dimensions and placement of the marking stripe shall be uniform and consistent on each step throughout exit enclosure.
4. Surface-applied marking stripes using adhesive-backed tapes shall not be used.



Exit Stair Landings (NFPA 101 Section 7.2.2.5.5.2)

The leading edge of exit stair landings must be marked with a solid and continuous marking stripe consistent with the dimensional requirements for stair treads and shall be the same length as, and consistent with, the stripes on the steps.



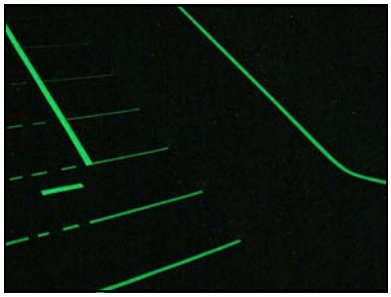


Exit Stair Handrails (NFPA 101 Section 7.2.2.5.5.3)

All handrails and handrail extensions shall be marked with a solid and continuous marking stripe and meet the following requirements:

1. The marking stripe shall be applied to the upper surface of the handrail or be a material integral with the upper surface of the handrail for the entire length of the handrail, including extensions.
2. The marking stripe shall have a minimum horizontal width of 1 inch (25mm).
3. The dimensions and placement of the marking stripe shall be uniform and consistent on each step throughout exit enclosure.





Perimeter Demarcation Markings (NFPA 101 Section 7.2.2.5.5.4)

Stair landings, exit passageways and other parts of the floor areas within the exit enclosure shall be provided with a solid or continuous perimeter demarcation marking stripe on the floor. The marking stripe shall also meet the following requirements:

1. The marking stripe shall have a minimum horizontal width of 1 in. (25mm) and maximum width of 2 in. (51mm), with interruptions not exceeding 4 in. (100mm).
2. The marking stripe shall be applied within 2 in. (51mm) of the wall.
3. The marking stripe shall continue in front of all door openings swinging into the exit enclosure. However, the marking stripe shall not be applied in front of door openings discharging from the exit enclosure.
4. The dimensions and placement of the perimeter demarcation marking stripe shall be uniform and consistent throughout the exit enclosure.
5. Surface-applied marking stripes using adhesive-backed tapes shall not be used.


Obstacles (NFPA 101 Section 7.2.2.5.5.5)

Obstacles that are in the exit enclosure at or below 6 ft 6 in. (1980mm) in height, and that project more than 4 in. (100mm) into the egress path, shall be identified with markings not less than 1 in. (25mm) in horizontal width comprised of a pattern of alternating equal bands of luminescent material and black; and with the alternating bands not more than 2 in. (51mm) in horizontal width and angled at 45 degrees.

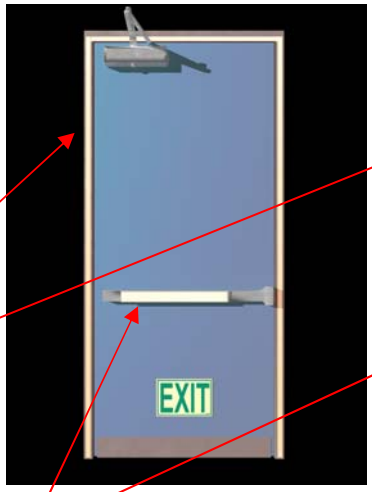
BS694BJGPE-P

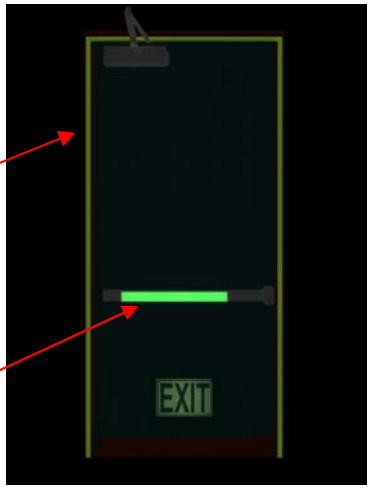
Doors Serving Exit Enclosures (NFPA 101 Section 7.2.2.5.5.6)

All doors serving the exit enclosures that swing out from the enclosure in the direction of egress travel shall be provided with a marking stripe on the top and sides of the door(s) frame(s). The marking stripe shall also meet the following requirements:

1. The marking stripe shall have a minimum horizontal width of 1 in. (25mm) and maximum width of 2 in. (51mm).
2. Gaps shall be permitted in the continuity of door frame markings where a line is fitted into a corner or bend, but shall be as small as practicable, and in no case shall gaps be greater than 1 in. (25mm)
3. Where the door molding does not provide enough flat surface on which to locate the marking stripe, the marking stripe shall be located on the wall surrounding the frame.
4. The dimensions and placement of the marking stripe shall be uniform and consistent on all doors in the exit enclosure.

DS81A0VBRE-P





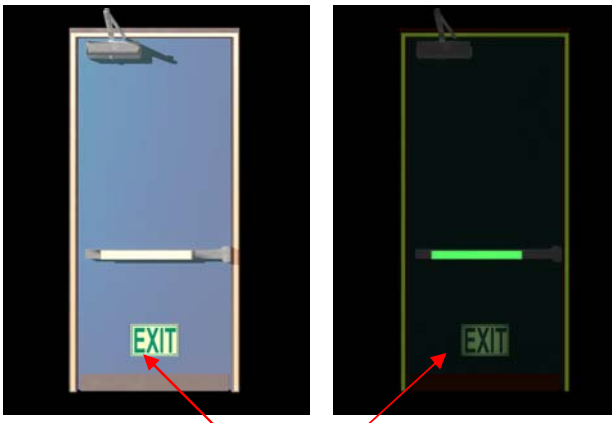
Door Hardware Marking (NFPA 101 7.2.2.5.5.7)

The door hardware for the doors serving the exit enclosure that swing out from the enclosure in the direction of egress travel shall be provided with a marking stripe. The marking stripe shall also meet the following requirements:

1. The door hardware necessary to release the latch shall be outlined with a marking stripe having a minimum horizontal width of 1 in. (25mm).
2. Where panic hardware is installed, the following criteria shall be met:
   A. The marking stripe shall have a minimum horizontal width of 1 in. (25mm) and be applied to the entire length of the actuating bar or touch pad.
   B. The placement of the marking stripe shall not interfere with viewing of any instructions on the actuating bar or touch pad.

Emergency Exit Symbol (NFPA 101 Section 7.2.2.5.5.8)
An emergency exit symbol with a luminescent background shall be applied on all doors serving the exit enclosure that swing out from the enclosure in the direction of egress travel. The emergency exit symbol shall also meet the following requirements:

1. The emergency exit symbol shall meet the requirements of NFPA 170, Standard for Fire Safety and Emergency Symbols.
2. The emergency exit symbol applied on the door shall be not higher than 18 in. (455mm) above the finished floor.



ES099LGVRE-P

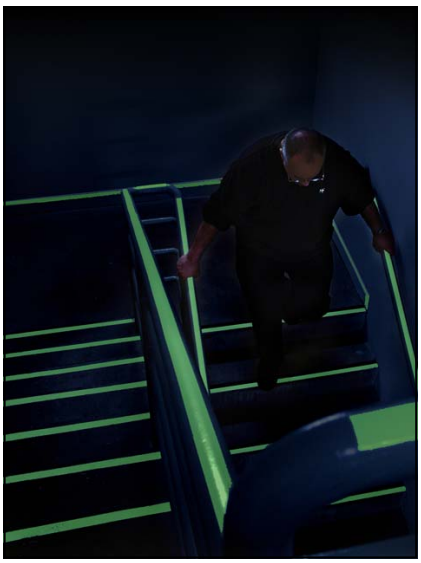
Uniformity (NFPA 101 Section 7.2.2.5.5.9)
Placement and dimensions of the marking stripes shall be consistent and uniform throughout the same exit enclosure.

Materials (NFPA 101 Section 7.2.2.5.5.10)
Exit stair path markings shall be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminescence. Such materials include, but shall not be limited to, self-luminous materials and photoluminescent materials. Materials shall comply with one of the following:

1. ASTM E 2073, Standard Test Method for Photopic Luminance of Photoluminescent (Phosphorescent) Markings, except that the charging source shall be 1 foot-candle (10.8 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 mcd/m^2 after 90 minutes.
2. UL 1994, Standard for Luminous Egress Path Marking Systems
3. An alternate standard deemed equivalent and approved by the authority having jurisdiction

HPP011DLNK-P

Exit Stair Illumination (NFPA 101 Section 7.2.2.5.5.11)



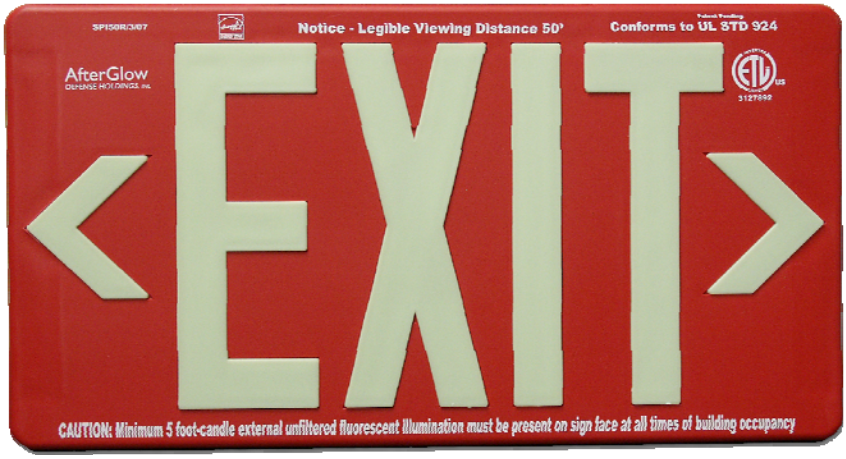
Exit enclosures where photoluminescent materials are installed shall be continuously illuminated for at least 60 minutes prior to periods when the building is occupied. Lighting control devices that automatically turn exit enclosure lighting on and off, based on occupancy, shall not be installed.

NFPA 101 Section 7.10 Marking Means of Egress

Mounting Location (NFPA 101 Section 7.10.1.9)
The bottom of new egress markings shall be located at a vertical distance of not more than 6 ft 8 in. (2030mm) above the top edge of the egress opening intended for designation by that marking. Egress markings shall be located at a horizontal distance of not more than the required width of the egress opening, as measured from the edge of the egress opening intended for designation by that marking to the nearest edge of the marking.

In simplest terms, this section addresses the mounting location of exit signs associated with an egress opening such as a door opening, an archway, or a portal. Its provisions are meant to keep the sign from being located too high above the egress opening and too far to the side of the egress opening, at which point the sign would be less effective in designating the opening as the egress route. The maximum 6 feet 8 inches cited above is the maximum height above the egress opening that the sign may be installed. Maximum horizontal offset is the width of the door opening (if the door was required to be 36 inches the signage would be located no more than 36 inches away in a horizontal direction.)

Listing (NFPA 101 Section 7.10.7.1)
Internally illuminated signs shall be listed in accordance with ANSI/UL 924, Standard for Emergency Lighting and Power Equipment, unless they meet one of the following criteria:
1. They are approved existing signs.
2. They are existing signs having the required wording in legible letters not less than 4 in. (100mm) high.
3. They are signs that are in accordance with 7.10.1.3 and 7.10.1.6.



(50-ft UL 924 Rated Sign)

(75-ft UL 924 Rated Sign)

Photoluminescent Signs (NFPA 101 Section 7.10.7.2)
The face of a photoluminescent sign shall be continually illuminated while the building is occupied. The illumination levels on the face of the photoluminescent sign shall be in accordance with its listing, as shown at the bottom of each of the signs in the two examples, above. The charging illumination shall be a reliable light source, as determined by the authority having jurisdiction. The charging light source, shall be of a type specified in the product markings.

Section 7.10.8 Special Signs

No Exit (NFPA 101 Section 7.10.8.3.1)
Any door, passage, or stairway that is neither an exit nor a way of exit access and that is located or arranged so that it is likely to be mistaken for an exit shall be identified by a sign that reads as follows:

NO
EXIT

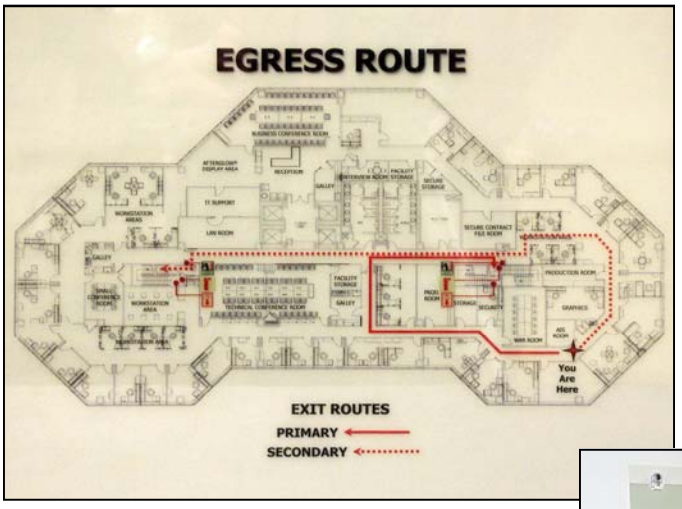
NFPA 101 Section 7.10.8.3.2 The "NO EXIT" sign shall have the word "NO" in letters 2 in. (51mm) high, with a stroke width of ⅜ in. (9.5mm), and the word "EXIT" in letters 1 in. (25mm) high, with the word "EXIT" below the word "NO," unless such sign is an approved existing sign.

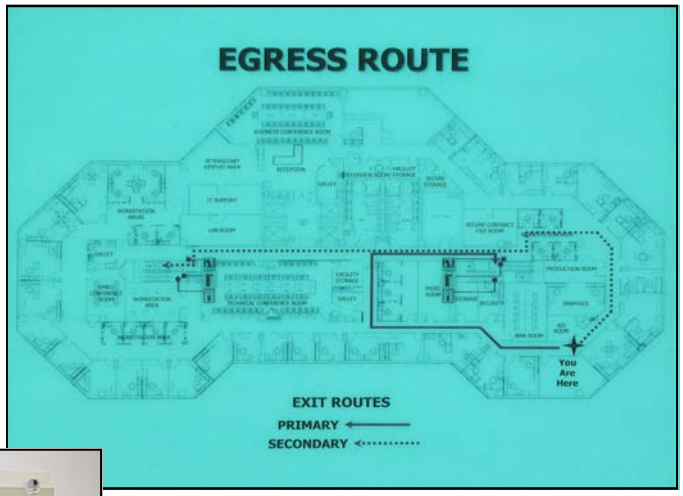
ES100NVGRE-P

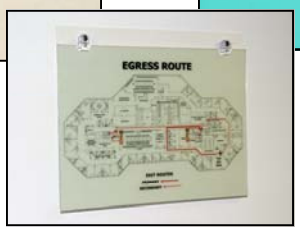
Elevator Signs (NFPA 101 Section 7.10.8.4)
Elevators that are a part of a means of egress (see 7.2.13.1) shall have the following signs with a minimum letter height of ⅝ in. (16mm) posted in every elevator lobby:

1. Signs that indicate that the elevator can be used for egress, including any restrictions on use
2. Signs that indicate the operational status of elevators.

Evacuation Diagram (NFPA 101 Section 7.10.8.5)
Where a posted floor evacuation diagram is required in Chapters 11-43, floor evacuation diagrams reflecting the actual floor arrangement and exit locations shall be posted and oriented in a location and manner acceptable to the authority having jurisdiction.







YAH001VMRE-P

Other NFPA Code Sections Impacting the 2009 Egress Regulations Include:

Section 7.1	General
Section 7.3	Capacity of Means of Egress
Section 7.4	Number of Means of Egress
Section 7.5	Arrangements of Means of Egress
Section 7.6	Measurement of Travel Distance to Egress
Section 7.7	Discharge from Exits
Section 7.8	Illumination of Means of Egress
Section 7.9	Emergency Lighting
Section 7.11	Special Provisions for Occupancies with High Hazard Concerns
Section 7.12	Mechanical Equipment Rooms, Boiler Rooms and Furnace Rooms

2009 NFPA 101 Glossary

ACCESSIBLE MEANS OF EGRESS (3.3.161.1)
A means of egress that provides an accessible route to an area of refuge, a horizontal exit, or a public way.

COMMON PATH OF TRAVEL (3.3.42)
The portion of exit access that must be traversed before two separate and distinct paths of travel to two exits are available.

EXIT (3.3.75)
That portion of a means of egress that is separated from all other spaces of a building or structure by construction or equipment as required to provide a protected way of travel to the exit discharge.

EXIT ACCESS (3.3.76)
That portion of a means of egress that leads to an exit.

EXIT DISCHARGE (3.3.77)
That portion of a means of egress between the termination of an exit and a public way.

LEVEL OF EXIT DISCHARGE (3.3.77.1)
The story that is either (1) the lowest story from which not less than 50% of the required number of exits and not less than 50% of the required egress capacity from such a story discharge directly outside at the finished ground level; or (2) where no story meets the conditions of item (1), the story that is provided with one or more exits that discharge directly to the outside to the finished ground level via the smallest elevation change.

MEANS OF EGRESS (3.3.161)
A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, (3) the exit discharge.

PHOTOLUMINESCENT (3.3.193)
Having the ability to store incident electromagnetic radiation typically from ambient light sources, and release it in the form of visible light.

What Service Maintenance is *required* by IBC 2009?

None*

What Service Maintenance is *required* by 2009 NFPA 101?

None*

*AfterGlow's Service Maintenance Plans

Why does AfterGlow recommend a Service Maintenance Plan?
Based upon AfterGlow's many, many years of installing these mandated materials, we recommend a Service Maintenance Plan because:

- Code requirements may change during the life of the building.
- Extensive wear and tear or pilferage may cause a need for some of the materials to require replacement.
- The building may have to undergo unexpected modifications.
- Some jurisdictions require periodic inspection, re-certification and reporting.

We offer these maintenance services under two plan options:

Standard Service Plan

- Establish maintenance procedures to ensure that signs and markings are kept in good repair.
- At minimum, every 12 months, AfterGlow will perform a visual and physical inspection of all signs and markings.
- AfterGlow will create a Maintenance Log and check to make sure that it is kept in the lobby so that building inspectors and fire code officials may inspect the Log at any time.
- All adjustments, repairs, and annual inspections will be recorded in the Log.

Extended Service Plan

- AfterGlow will review warranty plans from suppliers and installers and submit claims on behalf of the customer to these companies.
- AfterGlow shall arrange the prompt repair of any signs and markings that are missing, damaged, loose, or that show signs of wear. Again, all repairs and adjustments will be noted in the building's Maintenance Log.

Should a building owner or property manager desire to conduct its own repairs, adjustments, or inspections, AfterGlow can create a "customized" set of instructions for the appropriate maintenance personnel to follow.

Pricing will be determined by:

- The type and duration of the Service Maintenance Plan (1, 3, or 5 years)
- The size of the building (under 20 stories; 20 to 40 stories; or over 40 stories), and
- Optional Services (including replacement parts; repairs; consulting; and submissions of Certifications of Compliance)

LEED® Green Buildings

LEED® is an internationally recognized industry benchmark for green construction. It is a voluntary certification program for building owners and operators that provides a recognized standard for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED® represents a holistic approach to building sustainability that can be applied to any type of building type at any point in its lifecycle.

LEED® Key Performance Areas:

- Sustainable Sites
- Water Savings
- Energy Efficiency
- Materials Selection
- Indoor Environmental Quality

In addition to the environmental benefits of green building, application of LEED® standards can offer several very-real economic benefits. Energy- and water-efficient buildings typically cost much less to operate. Buildings incorporating effective green design concepts can cut their energy and water use in half compared to a traditional building. Comprehensive green building projects can reduce project development, infrastructure and materials costs.

LEED® Credits for Photoluminescent Exit Signs

Photoluminescent (glow-in-the-dark) exit signs are a product option that can contribute to earning LEED® credit points, while offering superior egress opportunities. Installation costs are very low, and more importantly, photoluminescent exit signs support sustainable building objectives.

Since they do not require electrical or radioactive illumination sources, photoluminescent exit signs have a longer lifespan than traditional exit signs. Photoluminescent exit signs consume zero energy because they are charged by ambient light. They require fewer building materials and less maintenance, combining for a much more attractive exit sign option than exit signs using incandescent, LED or tritium illuminators.

Due to their many environmental benefits, photoluminescent exit signs can earn buildings points in the following LEED® credits:

- **EA Credit 1:** Energy and Atmosphere: Optimizing Energy Performance
- **ID Credit 1:** Innovation in Design: Significant Environmental Benefits

EA Credit 1: Energy and Atmosphere (Optimizing Energy Performance)

Worth Up to 10 LEED® Credit Points

To earn points for the EA Credit 1, a building project must demonstrate incremental energy efficiency improvements above the required baseline criteria, which is typically specified in ASHRAE/IESNA Standard 90.1 or the "Basis Criteria and Prescriptive Measures" of the Advanced Buildings Benchmark. If a building project requires less energy than the minimums that these baseline guidelines require, it will receive the subsequent number of LEED® points.

The current LEED® guidelines are based on the use of conventional LED exit signs, which, at best, require approximately 5 watts of power per sign. If photoluminescent exit signs are installed instead of LED signs, they absorb ambient light during normal business hours and use this light energy to glow brightly when the lights go out, so the operating electrical cost is virtually eliminated. While 5 watts of power may seem trivial, the energy use adds up very quickly over time, especially in large building projects with hundreds of exit signs on 24 hours a day, 7 days a week. With photoluminescent exit signs, building projects can eliminate thousands of watts of electric power each year – a significant difference that yields positive LEED® calculations for the energy efficiency of the project.

ID Credit 1: Innovation in Design (Significant Environmental Benefits)

According to the LEED® Rating Systems, the ID Credit 1 is intended to reward design teams and projects for:

1. Exceptional performance above the requirements set by the LEED® Green Building Rating System.
2. Innovative performance in green building categories not specifically addressed by LEED®.

Photoluminescent exit signs can contribute to points earned for the second criteria because the environmental benefits of the signs span throughout the project's entire lifecycle – from design and procurement to construction, operations and decommissioning. Photoluminescent exit signs provide the following environmental benefits throughout the lifecycle of a building project:

Energy Efficiency
Photoluminescent exit signs continuously absorb ambient light and use this light energy to produce their characteristic afterglow when the lights go out. They require zero energy to operate, successfully saving energy throughout their entire period of use.

Less Building Material Requirements
Photoluminescent exit signs do not need conduit and cabling, switches, circuit breakers, and other metal parts that are required for the installation and operation of electric-powered exit signs. Additionally they do not require a secondary source of power, such as battery powered backup systems to ensure the exit signs remain lighted for 90 minutes. This reduces the quantity of building materials, and hence reduces harmful activities to the environment. Not only are fewer materials required, but less energy is then required to transport the materials to the building site.

Non-Toxic Construction
Unlike LED and tritium exit sign, photoluminescent signs do not contain any toxic or hazardous components. LED exit signs' circuit boards and battery back-up packs are considered "universal wastes" by the EPA and tritium exit signs are mandated by the Nuclear Regulatory Agency for their radioactivity. Both LED and tritium exit signs have regulations on how they can be disposed of due to their environmental hazards. Photoluminescent exit signs are not regulated in any way because they do not contain any radioactive materials.

How to Obtain LEED® Certification[5]

To earn LEED® certification, a building project must fulfill the prerequisites for basic green building and earn the necessary levels of performance points in the five key areas of human and environmental health:

1. Sustainable site development
2. Water savings
3. Energy efficiency
4. Indoor environmental quality, and
5. Materials selection.

LEED® Certification Steps

1. **Project Goals**
   Examine the building owner's commitment, budget and desire for LEED® certification. Determine which level of LEED® certification the building project is aimed for, and develop goals based on the desired level.

2. **Registration**
   Register the building project with the U.S. Green Building Council (USGBC) to receive the orientation materials. It is highly recommended to register the building project during the pre-design phase. (Registration fee required.)

3. **Strategy Development**
   Develop a strategy for the building project's certification based on credit categories and project capabilities. Using the USGBC's Reference Guide and Credit Rulings as a resource, determine the level of implementation and the credit categories to be pursued. Review the online certification procedures and tutorials for a LEED® project, and find the answers to any LEED® prerequisite and credit rating system questions.

4. **Certification and Documentation**
   Complete the application for certification and submit the application to be reviewed. Application review can take anywhere from six weeks to several months. There are several opportunities for response and appeal throughout the application review process (administrative, preliminary technical and final technical reviews).

LEED® Certification Levels

Certified:	26-32 points
Gold:	39-51 points
Silver:	33-38 points
Platinum:	52-69 points



[5] This handbook presents a summary of the LEED certification process. For complete details on how to obtain LEED certification, contact the U.S. Green Building Council.

Additional Considerations: Examples of AfterGlow's Photoluminescent Building Safety Paint and Signage

(Compliant with both **IBC Section 1024.4** and **NFPA 101 Section 7.2.2.5.5.10**)

HPP011DLNK-P

HPP012DGNK-P

SPP016DGNG-P

ES099LGVRE-P

(Compliant with both **IBC Section 1011.1** and **NFPA 101 Section 7.2.2.5.5.8**)

(Compliant with **IBC Section 1022.8.1** and **NFPA 101 Section 7.2.2.5.4**)

NFPA01JKRE-P

ES100NVGRE-P

(Compliant with **NFPA 101 Section 7.10.8.3.1** and **NFPA 101 Section 7.10.8.3.2**)

Examples of AfterGlow's UL-924 Listed Photoluminescent Exit Signs

SP500RPRIE-P

SP500GPGIE-P

SP500BPKIE-P

701100JRRE-P

SP750RPRIE-P

SP750GPGIE-P

SP75-BPKIE-P

702100JGRE-P

BGL101BRRE-P

BPL101BGRE-P

700100JKRE-P

703100JWRE-P

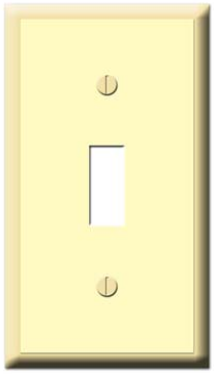
(Compliant with both **IBC Section 1011.4** and **NFPA 101 Section 7.10.7.1)**

Additional Considerations (continued):

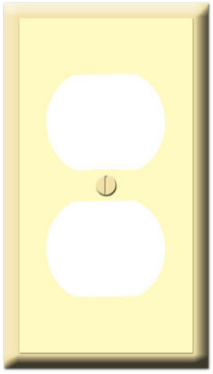
Examples of AfterGlow's Photoluminescent Marking Products

BS6040VGRE-P

DKR300PBIE-P



LSC100JBRP-P



ORC101JBRP-P

Examples of AfterGlow's Photoluminescent Tape Products

NLN131JBPE-P

DS81A0VBRE-P[1]

BS694BJGPE-P[2]

[1]Compliant with **IBC Sections 1024.2.4** and **1024.2.6.3** and **NFPA 101 Sections 7.2.2.5.5.4** and **7.2.2.5.5.6**

[2]Compliant with both **IBC Section 1024.2.5** and **NFPA 101 Section 7.2.2.5.5.5**

Additional Considerations (continued):

Examples of AfterGlow's New York City Local Law 26 Compliant Photoluminescent Products

F1STP0TKPE-N

R3SNURJGRE-N

R6SNR0JGRE-N

R9SNR0JGRE-N

NSSPL2JMPE-P

(Compliant with the relevant sections of both **IBC 2009** and 2009 **NFPA 101**)

Examples of AfterGlow's Photoluminescent Safety Signage

ES1130VGRE-P

FF3240VRRE-P

FF3280VMRE-P

YAH001VMRE-P

ES1270VGRE-P

FF3000VRRE-P

For a complete product listing, please consult the latest version of the AfterGlow® DIRECT Commercial Catalog or visit our online store at www.afterglowdirect.com

AfterGlow® Photoluminescent Safety Solutions®
181 Industrial Park Drive
Trenton, NC 28585-0091
1-877-AFT-GLOW (238-4569)
www.afterglowllc.com
www.afterglowdirect.com

Lighting Your Way to Safety®