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Inside This High-Rise Issue:

Doors, Hardware, and Codes

Perimeter Fire Protection in Mid- to High-Rise Buildings

High-Rise Building Safety -

Glowing Pathways and First Responders



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High-Rise Building Safety - Glowing Pathways and First Responders

By Steve Cooper

Well, the dust has finally settled in the building code debates regarding High Rise Building Egress requirements. Now we can get on with the business of educating everyone who participates and benefits from the related code adoptions of 2009 and 2012 for the International Building Code (IBC) and International Fire Code (IFC). The list of beneficiaries begins with High Rise Building occupants. The intended effect of the new codes was established primarily to save lives of people escaping from any emergency that requires evacuation of a high rise structure.

Benefits obvious to First Responders

The benefits quickly became obvious to First Responders as well. First responders like fire-fighters, medical personnel and law enforcement are now able to navigate a structure in the dark 30% more efficiently than before the codes were adopted.¹ Both occupants and first responders gain a measure of safety due to the advances in product technology that lead to the approval and adoption of new code requirements in the IBC and IFC for Chapter 10 Sections 1022 and 1024 "Means of Egress".

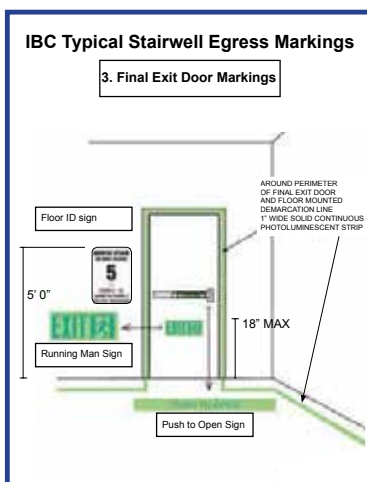
Manufacturers of egress components for high rise buildings developed the technologies and methods for application that benefit a wide range of communities. Beginning with the building occupants and first responders mentioned above and also the architectural and technical communities that now have enhanced life safety products to reduce life safety risks. Product choices that require very little energy and are primarily made of reusable resource materials are available from many manufacturers.

High Rise Building Evacuation philosophy

High rise buildings are defined as any building with occupants at a level 75 feet or higher above fire department access, according to the 2012 International Building Code and NFPA 101, The 2012 Life Safety Code. Manufacturers have the responsibility to educate the public, first responders, code enforcement agencies and architectural communities about High



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Rise Building Safety and these new requirements.

Building Occupant egress for high rise buildings has changed strategy in recent years. The primary change is the philosophy of evacuation. The strategy used prior to the collapse of the World Trade centers on Sept 11, 2001 was to evacuate occupants using a "floor by floor" method based on location of the danger.

The current strategy is "total building evacuation" with measures as rapidly as possible.

Excerpt from 2009 IFC 4604.23 Egress Path Markings, Code Commentary, "Historically, code requirements for high-rise buildings were written under the assumption that buildings would be evacuated floor-by-floor...Acts of terrorism and accidental incidents, such as power failures, have made it necessary to consider design for full building evacuation..."

First responders are key to high rise building safety because they bring order to very stressful and often chaotic emergencies. Their mission is to save lives. The advancements in Photoluminescent (PL) technologies have increased the potential lives saved beyond building occupants and extended the life saving benefits to first responders as well. They risk their lives as a routine part of their job. In Pennsylvania three firefighters lost their lives because they were disoriented and did not know which level of the building they were on. This confusion is believed to have lead to them being trapped in a dangerous location with tragic results.²

The IBC/IFC Chapter 10 Section 1022 was revised for the 2012 version of the code to require the addition of stairway identification signage with distinctive markings. These markings are intended to provide information for evacuees and first responders alike. Stairwell identification signage is required to be photoluminescent in high rise buildings because PL is known to function for an extended period in complete darkness even when backup generators fail to operate.

After complete power is cutoff or lost in a structure, PL egress markings light the way through darkness and smoke providing a 30% increase in

rescue efficiency according to tests conducted at the fire fighter training center in Anaheim, CA in 2011.³ PL egress markings were also proven to be as effective as standard lighting in a stairwell evacuation according to tests run by a Canadian laboratory after the world trade center evacuations.^{4,5}

Practical use of Photoluminescent Egress components

The 2012 version of IBC and IFC Chapter 10 both have sections 1022 and 1024 that require six distinctive components of PL pathway markings for high rise building egress. The 6 distinctive markings are:

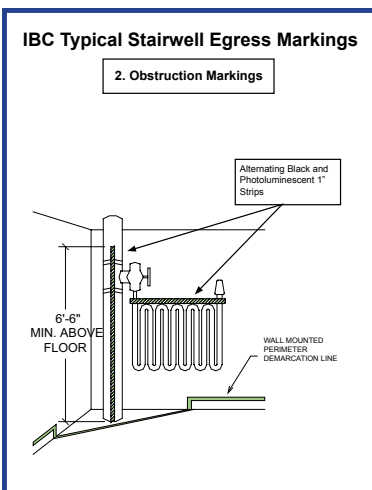
Per IBC/IFC Chapter 10 Section 1022 for version 2012 Stairway Identification Signage.

1. *Stairway Identification Signage.* A 12" wide x 18" tall sign is located 5'-0" above the floor in an egress stairway. The sign must be located in a place that is always visible, even when the door is open. See *illustration 4.*

The Stairway Identification sign must contain the following data:

- a. Identification of Stair or Ramp
- b. Availability of Roof Access or No Access
- c. Floor Level
- d. Braille floor number – Tactile Characters
- e. Terminus top and bottom
- f. Story and direction of Exit Discharge

Per IBC/IFC Chapter 10 Section 1024 for the codes, version dated 2012 Pathway Markings.



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2. *Stair Nosings* must be an integral part of the stair edge and have PL markings up to 1" wide within 1/2" of the leading edge of the step. The nosing must extend the full width of the steps. See *Illustration 1.*

3. *Handrail markings* must be placed on the top of the handrails for the continuous length of the handrails except for a 4" gap allowed at directional changes in the handrail. See *Illustration 1.*

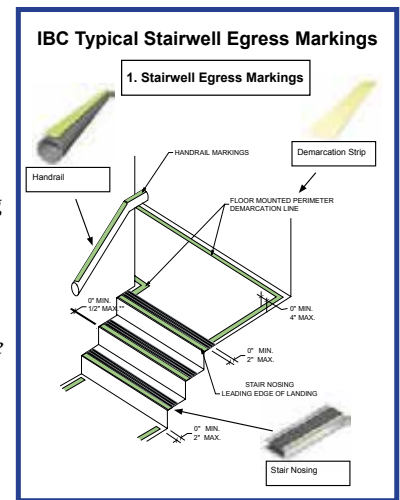
4. *Demarcation strips* are required at stair landings to guide occupants in a path that is intuitive from one level to the next. Demarcation is also required to direct any pathway that leads to a final exit door. See *Illustration 1.*
5. *Obstruction markings* are alternately striped black and PL yellow to provide warnings of objects that protrude 4" or more into a defined egress path. Common obstructions are fire hose cabinets, stand pipes, columns and header beams that extend below 6'-6" from the landings or steps. See

Illustration 2.

6. *Final Door Markings* are required only at the door leading directly to an approved building exit or for doors that must be passed through in order to reach a final exit door. See *Illustration 3.*

Final exit door markings are:

- a. Demarcation strip around the door frame but not across the base of the door frame.
- b. Door handle markings must be minimum 16 square inches of material either in the form of a strip on or above a push bar or in a square or rectangle adjacent to a door handle or knob.
- c. A running man sign must be located 18" above the floor in the center of the final exit door.



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Photoluminescent technology saves lives by lighting a glowing path for a critical duration of time to evacuate occupants and navigate stairways during extreme circumstances like total darkness due to loss of power in a high rise building. PL glows through darkness and smoke filled stairways allowing first responders to get in and find their way to alleviate the threat and evacuate building occupants in a manner that is safer for everyone. 🔥

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