

## 7.8 Illumination of Means of Egress

When fire occurs in a building, the degree of visibility in aisles, corridors, stairs, and exit passageways might mean the difference between orderly evacuation and chaos and, possibly, the difference between life and death. A brief glance at the history of fires reveals several noteworthy fires in which the failure of normal or emergency lighting was a major factor in the casualties incurred. The following is a list of some of these fires:

Iroquois Theater, Chicago, 1903	602 deaths <sup>32</sup>
Cocoanut Grove Night Club, Boston, 1942	492 deaths <sup>33</sup>
Baltimore Oyster Roast, Baltimore, 1956	11 deaths <sup>34</sup>
Apartment house, Boston, 1971	8 deaths <sup>35</sup>
Summerland amusement complex, Isle of Man, 1973	50 deaths <sup>36</sup>
Psychiatric hospital, Mississippi, 1978	15 deaths <sup>37</sup>

The report on the 1971 Massachusetts apartment fire where eight people died stated “Among the conditions contributing to the ... loss of life were ... the lack of emergency lighting and the lack of illuminated exit signs.”

The report on the 1973 fire in the amusement complex on the Isle of Man in Great Britain, where 50 people died, stated “The problems with the evacuation are ... (5) An insufficient number of exit signs and directional signs ... (7) The emergency lighting did not come on when the main power was shut off by a staff member in an act of misguided zeal.”

The report on the 1978 mental hospital fire in Mississippi, where 15 people died, stated:

Heat and flame ... impinged directly on the emergency lighting conduit, causing ... a short circuit to occur. The short tripped the circuit breaker ... leaving the north end of the building without emergency lighting. However, in this fire, the emergency lighting circuits on the first floor were not used. The dual-function lighting circuits were switched in the “off” position in both wards. The attendant entering Ward 1 to evacuate the residents did not turn the lights on. In Ward 2, the attendants could not reach the switch, and the circuit shorted out soon after the discovery of the fire. The darkness contributed to the difficulty in evacuating both wards.<sup>38</sup>

A lack of illuminated exit signs in several key places was also noted in the report.

### 7.8.1 General.

#### 7.8.1.1\*

Illumination of means of egress shall be provided in accordance with Section 7.8 for every building and structure where required in [Chapters 11](#) through [43](#). For the purposes of this requirement, exit access shall include only designated stairs, aisles, corridors, ramps, escalators, and passageways leading to an exit. For the purposes of this requirement, exit discharge shall include only designated stairs, aisles, corridors, ramps, escalators, walkways, and exit passageways leading to a public way.

#### **A.7.8.1.1**

Illumination provided outside the building should be to either a public way or a distance away from the building that is considered safe, whichever is closest to the building being evacuated.

The means of egress (i.e., exit access, exit, and exit discharge) encompasses practically all spaces where persons can be present. The subject addressed by Section 7.8 is illumination of means of egress. It would seem that the title of Section 7.8 indicates that such illumination needs to be provided throughout all portions of the exit access, the exit, and the exit discharge, but this is not so. Illumination is required throughout the exit (e.g., an enclosed exit stair or exit passageway). Yet, 7.8.1.1 clarifies that, for the purposes of applying the requirements of Section 7.8, the portions of the exit access and exit discharge requiring illumination are only the “designated” egress paths, such as aisles, corridors, stairs, and ramps. “Designated” is meant to indicate designation by the authority having jurisdiction (AHJ). For example, most authorities having jurisdiction do not designate the space within an individual’s work cubicle as a portion of the exit access required to be illuminated, but the aisles serving multiple cubicles are typically designated as requiring illumination.

Illumination of means of egress is not required unless specifically called for in the appropriate occupancy chapter. However, all occupancy chapters do require illumination, but there are a few exemptions. For example, in new assembly occupancies, [12.2.8](#) exempts private-party tents not larger than 1200 ft<sup>2</sup> (112 m<sup>2</sup>) from the illumination requirement. Subsection \_\_.2.8 (e.g., 36.2.8 for new mercantile occupancies) of each occupancy chapter provides illumination requirements.

#### **7.8.1.2**

Illumination of means of egress shall be continuous during the time that the conditions of occupancy require that the means of egress be available for use, unless otherwise provided in 7.8.1.2.2.

##### **7.8.1.2.1**

Artificial lighting shall be employed at such locations and for such periods of time as are necessary to maintain the illumination to the minimum criteria values herein specified.

##### **7.8.1.2.2**

Unless prohibited by [Chapters 11](#) through [43](#), automatic, motion sensor–type lighting switches shall be permitted within the means of egress, provided that the switch controllers comply with all of the following:

1. The switch controllers are listed.
2. The switch controllers are equipped for fail-safe operation and evaluated for this purpose.
3. The illumination timers are set for a minimum 15-minute duration.
4. The motion sensor is activated by any occupant movement in the area served by the lighting units.
5. The switch controller is activated by activation of the building fire alarm system, if provided.

#### **7.8.1.2.3\***

Energy-saving sensors, switches, timers, or controllers shall be approved and shall not compromise the continuity of illumination of the means of egress required by 7.8.1.2.

#### **A.7.8.1.2.3**

A consideration for the approval of automatic, motion sensor–type lighting switches, controls, timers, or controllers is whether the equipment is listed as a fail-safe device for use in the means of egress.

#### **7.8.1.3\***

The floors and other walking surfaces within an exit and within the portions of the exit access and exit discharge designated in 7.8.1.1 shall be illuminated as follows:

1. (1)

During conditions of stair use, the minimum illumination for new stairs shall be at least 10 ft-candle (108 lux), measured at the walking surfaces.

2. (2)

The minimum illumination for floors and walking surfaces, other than new stairs during conditions of stair use, shall be to values of at least 1 ft-candle (10.8 lux), measured at the floor.

3. (3)

In assembly occupancies, the illumination of the walking surfaces of exit access shall be at least 0.2 ft-candle (2.2 lux) during periods of performances or projections involving directed light.

4. (4)\*

The minimum illumination requirements shall not apply where operations or processes require low lighting levels.

#### **A.7.8.1.3**

A desirable form of means of egress lighting is by lights recessed in walls about 12 in. (305 mm) above the floor. Such lights are not likely to be obscured by smoke.

The *Code* requires that there be at least 1 ft-candle (10.8 lux) of illumination at floor level.

[Exhibit 7.182](#) Exterior stair illumination via lights in stair handrail... [Exhibit 7.183](#) Interior stair... [Exhibit 7.184](#) Poorly lighted interior...

Paragraph 7.8.1.3(1), requiring at least 10 ft-candle (108 lux) for new stairs during conditions of stair use, was added for the 2003 edition of the *Code*. Note that, during conditions where the stair is not being used but the building is occupied, there must be at least 1 ft-candle (10.8 lux) of illumination on the stair walking surfaces in compliance with 7.8.1.3(2). An arrangement that might be used to comply with 7.8.1.3(1) and (2) would include illuminating the stair to a minimum of 1 ft-candle (10.8 lux) during periods that the building is occupied and using motion detectors to sense occupant presence in any portion of the stair enclosure that, upon activation, would increase the illumination level to the minimum 10 ft-candle (108 lux) requirement. [Exhibit 7.182](#) and [Exhibit 7.183](#) show novel lighting techniques — ensuring that stair treads are adequately illuminated and tread edges are easily discerned by stair users — for an outdoor stair and an indoor stair, respectively. [Exhibit 7.184](#) shows a stair with questionable illumination, especially given that occupants who use the stair in the downward direction are coming from the area near a building window wall with bright outdoor lighting.

When motion pictures, slides, and the like are being shown in theaters, auditoriums, and other assembly occupancies, 7.8.1.3(3) permits the level of illumination to be reduced to 0.2 ft-candle (2.2 lux).

Paragraph 7.8.1.3(4) recognizes that some operations (e.g., photographic film manufacturing) require low lighting levels. Special precautions can be taken for occupant life safety so as not to have to require a minimum illumination level.

#### **A.7.8.1.3(4)**

Some processes, such as manufacturing or handling of photosensitive materials, cannot be performed in areas provided with the minimum specified lighting levels. The use of spaces with lighting levels below 1 ft-candle (10.8 lux) might necessitate additional safety measures, such as written emergency plans, training of new employees in emergency evacuation procedures, and periodic fire drills.

#### **7.8.1.4\***

Required illumination shall be arranged so that the failure of any single lighting unit does not result in an illumination level of less than 0.2 ft-candle (2.2 lux) in any designated area.

#### **A.7.8.1.4**

An example of the failure of any single lighting unit is the burning out of an electric bulb.

All lights, circuits, or auxiliary power must be arranged to ensure continuity of egress lighting, although the performance level is permitted to decline from 1 ft-candle (10.8 lux) to 0.2 ft-candle (2.2 lux) if a system element fails. Continuity of egress lighting can be accomplished by means such as use of duplicate light bulbs in fixtures or overlapping light patterns from neighboring fixtures.

#### **7.8.1.5**

The equipment or units installed to meet the requirements of [Section 7.10](#) also shall be permitted to serve the function of illumination of means of egress, provided that all requirements of Section 7.8 for such illumination are met.