

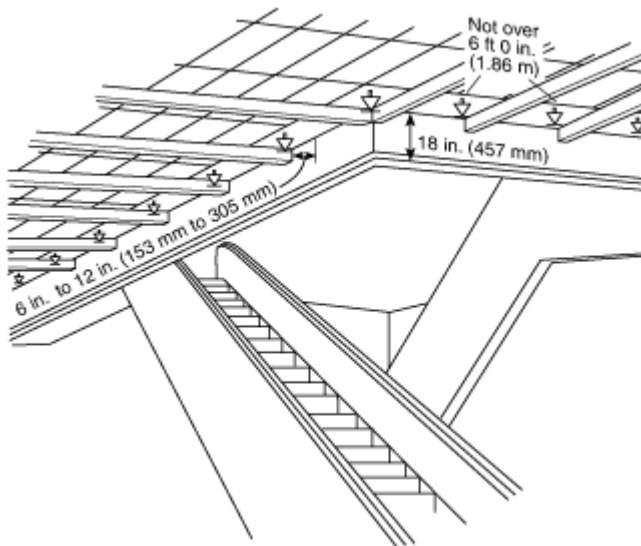
## Protection of Vertical Openings by NFPA 13 Sprinkler Systems

### Abstract:

Although the building codes do not generally require protection of an opening between two floors, such as for a convenience stair or a balcony overlook, NFPA 13, the Standard for sprinklers does require additional protection for these openings.

When sprinklers are installed in a building, the lower level opening shall have sprinklers on 6-foot centers and an 18-inch draft curtain around the entire opening. The purpose of the draft curtain is to force the heat down and back on itself, which will result in a curtain wall of sprinklers operating in the fire area. This function is to keep the fire from wrapping up the balcony/opening and spreading to the floor above. This requirement is significant with respect to sizing the sprinkler design area and number of potentially flowing heads.

**Architecturally, you need to account and provide an aesthetic approach to this 18-inch curtain wall. Hanging glass or soffits are commonly used. You can generally just extend the face wall down 18-inches. Ceiling height becomes a critical factor.**



This has typically been known as an escalator-opening requirement as the building codes do require similar (not exact) requirements for escalators. However, **NFPA 13 requires this for any such opening in a fully sprinklered building.** This has been confirmed with a formal interpretation request from NFPA.

### 1999 NFPA 13 Requirements

#### **5-13.4\* Vertical Openings.**

Where moving stairways, staircases, or similar **floor openings are unenclosed, the floor openings involved shall be protected by closely spaced sprinklers in combination with draft stops. The draft stops shall be located immediately adjacent to the opening, shall be at least 18 in. (457 mm) deep**, and shall be of noncombustible or limited-combustible material that will stay in place before and during sprinkler operation. **Sprinklers shall be spaced not more than 6 ft (1.8 m) apart and placed 6 in. to 12 in. (152 mm to 305 mm) from the draft stop on the side away from the opening.** Where sprinklers are closer than 6 ft (1.8 m), cross baffles shall be provided in accordance with 5-6.3.4.

Exception No. 1: **Closely spaced sprinklers and draft stops are not required around large openings** such as those found in shopping malls, atrium buildings, and similar structures where all

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adjoining levels and spaces are protected by automatic sprinklers in accordance with this standard and where the openings have all horizontal dimensions between opposite edges of **20 ft (6 m) or greater** and an area of 1000 ft<sup>2</sup> (93 m<sup>2</sup>) or greater.

Exception No. 2: Draft stops and closely spaced sprinklers are not required for convenience openings within individual dwelling units that meet all of the following criteria:

- (a) Such openings shall connect a maximum of two adjacent stories (pierce one floor only).
- (b) \* Such openings shall be separated from unprotected vertical openings serving other floors by a barrier with a fire resistance rating equal to that required for enclosure of floor openings by NFPA 101®, Life Safety Code®.
- (c) Such openings shall be separate from corridors.
- (d) Such openings shall not serve as a required means of egress, although they can serve as a required means of escape.

## 2002 NFPA 13 Requirements (same, reformatted in new code)

### **8.14.4\* Vertical Openings.**

**8.14.4.1 General.** Unless the requirements of 8.14.4.4 or 8.14.4.5 are met, where moving stairways, staircases, or similar floor openings are unenclosed, the floor openings involved shall be protected by closely spaced sprinklers in combination with draft stops in accordance with 8.14.4.2 and 8.14.4.3.

**8.14.4.2 Draft Stops.** Draft stops shall meet all of the following:

- (1) The draft stops shall be located immediately adjacent to the opening.**
- (2) The draft stops shall be at least 18 in. (457 mm) deep.**

(3) The draft stops shall be of noncombustible or limited-combustible material that will stay in place before and during sprinkler operation.

### **8.14.4.3 Sprinklers.**

**8.14.4.3.1 Sprinklers shall be spaced not more than 6 ft (1.8 m) apart and placed 6 in. to 12 in. (152 mm to 305 mm) from the draft stop** on the side away from the opening.

**8.14.4.3.2** Where sprinklers are closer than 6 ft (1.8 m), cross baffles shall be provided in accordance with 8.6.3.4.2.

**8.14.4.4 Large Openings.** Closely spaced sprinklers and draft stops are not required around large openings such as those found in shopping malls, atrium buildings, and similar structures where all adjoining levels and spaces are protected by automatic sprinklers in accordance with this standard and where the openings have all horizontal dimensions between opposite edges of **20 ft (6 m) or greater** and an area of 1000 ft<sup>2</sup> (93 m<sup>2</sup>) or greater.

**8.14.4.5 Convenience Openings in Individual Dwelling Units.** Draft stops and closely spaced sprinklers are not required for convenience openings within individual dwelling units that meet all of the following criteria:

- (1) Such openings shall connect a maximum of two adjacent stories (pierce one floor only).
- (2)\* Such openings shall be separated from unprotected vertical openings serving other floors by a barrier with a fire resistance rating equal to that required for enclosure of floor openings by NFPA 101®, Life Safety Code®.
- (3) Such openings shall be separate from corridors.
- (4) Such openings shall not serve as a required means of egress, although they can serve as a required means of escape.