



Tuesday e-Tech Alert March 29, 2005

Installation Requirements Questions

The NFSA is currently conducting a 10-part internet-based seminar series focusing on the 2002 edition of NFPA 13. This edition of the Tuesday e-Tech Alert shares a few of the questions raised by participants during the fourth and fifth seminars in the series, which addressed Chapter 8 – Installation Requirements:

1. Size of Systems with Fire Walls

Q: Would a single sprinkler riser be permitted for a building greater than 52,000 sq ft on a single floor with fire walls between adjacent spaces so that no single space between fire walls is greater than 52,000 sq ft?

A: No, the floor space for determining the number of required risers is counted regardless of the existence of fire separations and even fire walls. This is due to a concern regarding potential openings in fire walls and the ability to prevent fire spread through those openings. While it is true that fire separations between floors also have openings, building codes have traditionally had more severe opening protection requirements. Also, it is typical for building occupants to prop doors open, even those in fire rated walls, whereas it is not common for building occupants to violate the fire rated separation between floors.

2. Sidewall Sprinklers Below Overhead Doors

Q: Why aren't walls required behind sidewall sprinklers beneath overhead doors?

A: The allowance for sidewall sprinklers under overhead doors without walls being present is a practical consideration. When the door is in the open position, it is presumed that enough heat will be trapped by the door to activate the sprinkler. The activating link of a sidewall sprinkler in this situation is in a location similar to that of an upright or pendent sprinkler, so the activation time should be fairly similar.

3. Extended Coverage Sprinklers and Web Members Over One inch

Q: Per Section 8.4.3 extended coverage sprinklers cannot be used when the web member is over one inch in size. Can these sprinklers be used if the "four times rule" is met?

A: No. There are only two circumstances under which EC sprinklers can be used where the web members are more than 1 inch wide in the maximum dimension. The first is where the sprinklers are specially listed for use with larger web members as in noncombustible obstructed construction. The second is where the trusses or bar joists are more than 7.5 ft apart and ceiling slope does not exceed 1 in 6. In this latter case the sprinklers are required to meet the "four times rule" with respect to the individual trusses or bar joists. If neither of these two options is met, the EC sprinkler cannot be used when the web members are greater than 1 inch.

4. Bar Joist Bridging as an ESFR Sprinkler Obstruction

Q: Does bridging between bar joists count as obstructions when using ESFR sprinklers?

A: Yes. Bridging between bar joists is typically performed with very small (less than an inch wide) pieces of steel, but they can still be significant obstructions to ESFR sprinklers if they are too close. The sprinkler needs to be at least 12 inches horizontally away from the bridging or at least 2 ft above the bridging (assuming the bridging is less than 2 inches in diameter).

Fire tests were performed with 5/8-inch bridging close to ESFR sprinklers (within the 12 inch area horizontally) and this one small obstruction was enough to prevent the sprinklers from suppressing the fire. In fact, the sprinklers were not able to control the fire because additional ESFR sprinklers opened (more than 12) and the design area was overrun, causing the water supply to be inadequate.

5. Size of Openings to Noncombustible Concealed Spaces

Q: NFPA 13 Section 8.14.1.2.1 allows concealed spaces not requiring sprinkler protection to have a "small opening" - is there a specific allowable size?

A: No. The section uses return air plenum grilles as an example of what is acceptable, but does not get more specific. Anything larger than a 2 x 4 ceiling tile would probably be suspect. From a fire protection standpoint, the actual acceptable size would depend on the ceiling height, since it is important that the fire plume be wide enough to be able to spread across the ceiling to activate the sprinklers below and avoid going up into the concealed space. Higher ceilings can accommodate larger openings without problems since the plume gets wider as it rises.

6. Size of Dwelling Unit Bathrooms

Q: Do you count the floor area where the tub/shower is located in a dwelling unit bathroom when determining the maximum 55 sq. ft. of floor space?

A: The 2002 edition of NFPA 13 introduced a definition of "bathroom" in Section 3.3.3 that defines it as any room or compartment within a dwelling unit that contains a lavatory, water closet, shower or tub, or any combination thereof. The corresponding annex material in A.3.3.3 clarifies that two bathrooms can be adjacent to each other and sprinklers can be omitted from both if they meet the criteria. If the tub/shower area were separated by a door or by a limited opening with a lintel so as to satisfy the definition of compartment per Section 3.3.6, its area would be determined separately.

7. Fire Department Connection Sizing

Q: Is the FDC intended to provide total sprinkler/standpipe demand?

A: No. There is no attempt to match the number of fire department connections to the demand of a system other than the exclusion for deluge systems for which it is obvious that the fire department cannot provide adequate support.

Upcoming NFSA Technical Tuesday Online Seminars:

NFPA 13 Chapter 9 – Hanging, Bracing and Restraint of System Piping

Instructor: Victoria B. Valentine, P.E.

Date: April 5, 2005

The hanging and bracing requirements of NFPA 13 are arranged so that they can be referenced for use by other NFPA standards for water-based fire extinguishing systems. Separate sets of requirements address the hangers themselves, hanger installation and protection of piping against earthquakes.

This is the sixth in the series of ten seminars dedicated to an in-depth review of the 2002 edition of NFPA 13. Participants will develop an appreciation for the way in which the material is organized in the 2002 edition while learning more about the background of the rules themselves. The level of all seminar topics is considered intermediate. These seminars are being offered as a complete program on NFPA 13 - a 10% discount is available if signing up for all five remaining seminars in the series.

Information and registration for these seminars are available at www.nfsa.org.