

Tuesdaye-Tech Alert

November 29, 2005



Whatever Happened to Panel Construction?

Prior to the 1991 edition of NFPA 13, the standard identified specific construction types and assigned sprinkler spacing and positioning rules accordingly. One of those types was panel construction, defined in the 1989 edition as follows:

4-1.3.4 Panel Construction. The term panel construction as used in this standard includes ceiling panels formed by members capable of trapping heat to aid the operation of sprinklers and limited to a maximum of 300 sq ft (27.9 m²) in area. Beams spaced more than 7½ ft (2.3 m) apart and framed into girders qualify for panel construction provided the 300 sq ft (27.9 m²) area limitation is met.

Beginning with the 1991 edition the standard moved to the more generalized definitions of “obstructed” and “unobstructed” construction. In this manner the standard was better able to accommodate the many variations in construction features seen in the field. Along with the other traditional construction type definitions, the definition of panel construction lives on in the annex of NFPA 13 (A.3.7.1 (4) of the 2002 edition).

What was the advantage of panel construction? Due to the heat trapping capability of the panels, panel construction was penalized less than some types of construction with members that more readily channeled the heat from a fire, potentially delaying sprinkler operation. Compared to “beam and girder” construction (with members spaced 3 to 7½ ft on center) panel construction was given an advantage with regard to maximum sprinkler distance below the deck. Sprinklers located under the beams in beam and girder construction were required to be positioned with deflectors 1 to 4 inches below the beams but not more than 20 inches below combustible or noncombustible roof or floor decks. If the sprinklers were located in the bays of such construction they were required to have their deflectors not more than 16 inches below combustible or noncombustible roof or floor decks. In panel construction, however, sprinklers under beams were likewise required to be positioned with deflectors 1 to 4 inches below the beams but not more than 22 inches below combustible or noncombustible roof or floor decks. If the sprinklers were located in the bays of panel construction they were required to have their deflectors not more than 18 inches below combustible or noncombustible roof or floor decks.

When the more generalized “obstructed construction” rules were put into place, they were written to allow sprinklers to be placed with deflectors 1 to 6 inches below the bottom of structural members with deflectors not more than 22 inches below the deck, regardless of whether the beams and girders were arranged to trap heat in pockets.

Has all relevance of panel construction therefore been removed from the standard? Not entirely. Since the definition remains in the annex, it provides guidance by which sprinklers can be placed up to 22 inches below the ceiling/roof deck even if structural members are spaced more than 7 ½ ft on center. Such construction would normally be considered unobstructed, and sprinkler deflectors would be required to be placed 1 to 12 inches below the deck. If, however, members are capable of trapping heat in pockets not exceeding 300 sq ft, the panel construction criteria could be applied.

Upcoming NFSA Technical Tuesday Online Seminar

Topic: Fire Department Connections

Instructor: Cecil Bilbo, NFSA Director of Technical Services

Date: December 6, 2005

This seminar will discuss the requirements for Fire Department Connections on Automatic Fire Sprinkler Systems. The seminar will focus on the design and testing requirements from NFPA 13, NFPA 14 and NFPA 25. The requirements for material selection from NFPA 13 and NFPA 1963 will also be covered.

To register visit www.nfsa.org.

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