

Tuesdaye-Tech Alert

November 15,2005



The Missing IBC Seismic Reference to NFPA 13

As the 2003 edition of the International Building Code is being adopted in various states, the reference to NFPA 13 within the earthquake protection requirements has caused confusion and concern. More to the point, the deletion of the reference.

The 2000 edition of the IBC contained 1621.3.10.1 that specifically recognized the use of NFPA 13 for use in applying the earthquake protection criteria:

“1621.3.10.1 Fire-protection sprinkler systems. Fire-protection sprinkler systems designed and constructed in accordance with NFPA 13, shall be deemed to meet the force, displacement, and other requirements of this section provided that the seismic design force and displacement calculated in accordance with NFPA 13 when multiplied by a factor of 1.4 are determined to be not less than that prescribed by the code.”

Unlike the 2000 edition of the IBC, the 2003 edition references ASCE 7-02 – *Minimum Design Loads for Buildings and Other Structures* for many of the detailed earthquake protection requirements. These detailed requirements were originally developed with Federal funding to NEHRP (the National Earthquake Hazards Reduction Program) as administered through the National Institute of Building Sciences. Within ASCE 7-02 there is a similar reference to NFPA 13:

“9.6.3.11.2. Fire Protection Sprinkler Systems. Fire protection sprinkler systems designed and constructed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems* (Ref. 9.6-12), shall be deemed to meet the other requirements of this Section, except the force and displacement requirements of Sections 9.6.1.3. and 9.6.1.4 shall be satisfied.”

The 1.4 factor, which was intended to account for the difference between the allowable stress design methods that are the basis of the NFPA 13 criteria as opposed to the strength design method of the NEHRP criteria, is contained in ASCE 7-02 in a more general way.

What concerns some people is that, in its adoption of ASCE 7-02, the 2003 edition of the IBC specifically excludes this reference:

“1621.1.1 ASCE 7, Section 9.6.11.2: Section 9.6.3.11.2 shall not apply”

Is this significant? No, it is not. NFPA 13 (1999 edition) is nevertheless referenced by the 2003 IBC as the standard for installation of sprinkler systems in Section 903.3.1.1. NFPA 13 itself defers to the force factors developed in the building code, which take precedence over the traditional value of half the weight of the water-filled piping (per the exception to 6-4.5.6 in the 1999 edition). NFPA 13 accommodates what are considered maximum potential displacement requirements (story drift) through the provision of two flexible couplings on the riser per floor. The NFPA 13 approach to bracing and flexibility can continue to be used to carry out the force and displacement requirements of the 2003 IBC.

The NFPA 13 Technical Committee on Hanging and Bracing includes representatives from the structural engineering community, and continues to monitor developments in the earthquake protection field to ensure continued use of NFPA 13 for earthquake protection layout and detailing. Tentative Interim Amendment (TIA) 02-1, issued in July of 2003 to the 2002 edition of NFPA 13 to modify the fastener and other earthquake protection criteria of NFPA 13 (*available at www.nfpa.org - go to Code Development Process*) was an example of the effort to ensure continued reliance on the NFPA sprinkler standard.

Upcoming NFSA Technical Tuesday Online Seminar

Topic: Obstructions

Instructor: Kenneth E. Isman, P.E., NFSA Assistant Vice President of Engineering

Date: November 22, 2005

This program will review the obstruction rules for standard spray sprinklers, extended coverage sprinklers, residential sprinklers and ESFR sprinklers. Basic clearance issues will be discussed along with the beam rule, three-times rule (four-times rule for extended coverage) and the partition rule. Isolated and continuous obstructions for ESFR sprinklers will be covered along with a discussion of specially listed ESFR sprinklers that are less susceptible to obstruction concerns.

To register visit www.nfsa.org.

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