



Tuesday e-Tech Alert April 12, 2005

Hanging and Bracing 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 sixth seminar in the series, which addressed Chapter 9 – Hanging, Bracing, and Restraint of System Piping:

1. Attaching Hangers and Braces to a Bottom Chord

Q: Is it allowable to attach hangers and seismic bracing to the bottom chord of a bar joist or girder?

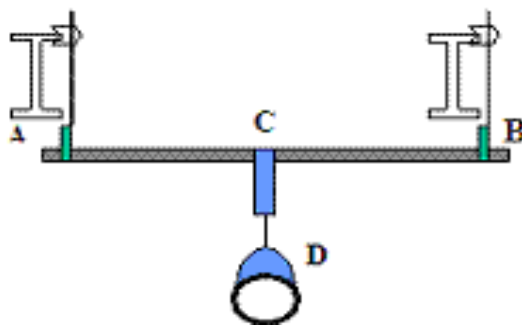
A: For hangers, the answer is “yes.” There is nothing in NFPA 13 that would prohibit this type of arrangement. However, it is easier for a bar joist to carry the load from the top chord. As such, the attachment to the top may become a requirement from the structural engineer if the engineer’s calculations indicate the bar joist may only be capable of supporting the necessary load from that position.

With regard to earthquake bracing, NFPA 13 would not allow use of the bottom chord where the earthquake load is perpendicular to the run of a bar joist or girder, as in fastener scenarios D, E and F of Figure 9.3.5.9.1. As with a solid wood beam, the fastener connection must be made toward the top of the structural member to avoid an overturning moment.

2. Sizing Rods and Rings for Trapeze Hangers

Q: In a typical trapeze hanger, how are the hanger rods and rings required to be sized?

A: In the following figure, rings labeled A and B are sized according to the trapeze member, while C and D are sized for the size of the sprinkler piping being supported. The rods are sized the same. The rods connecting A and B to the structure are sized for the trapeze pipe and the rod between C and D is sized for the sprinkler pipe.



3. Drops to Cabinets and Test Valves in Earthquake Areas

Q: Where systems are required to be protected against earthquakes, is it required to install flexible couplings at the bottom of drops to hose cabinets and inspector’s test valves?

A: Yes, Section 9.3.2.3 (5) requires that flexible couplings be installed at the tops and bottoms of all such drops. As with other risers, one flexible coupling would be presumed adequate for drops 3 to 7 ft in length with none needed for drops less than 3 ft in length.

4. Earthquake Bracing on Small Branch Lines and Mains

Q: Is seismic bracing required on branch lines or mains smaller than 2-½ inch?

A: For branch lines the answer is “no”. For mains, the answer is “yes” - bracing is required no matter the size of the main.

5. Restraint at the End of Branch Lines in Earthquake Areas

Q: Would compliance with the Section 9.3.6.3 requirement for restraint at the end of branch lines in areas subject to earthquakes be achieved by running the hanger rod down through the hanger rings to the top of the pipe?

A: Yes, but only if the sprinkler is mounted within a substantial ceiling that will ensure restraint in the lateral direction. To run the hanger rod tight to the pipe is one method of providing upward restraint against the thrust of high pressures, and it can serve the same purpose for earthquake protection. Hanger manufacturers also make available restraining clips that can fill the void and restrain the pipe from moving upward.

6. Earthquake Loads to Mains from Branch Lines with Short Hangers

Q: If branch lines are supported using hanger rods less than 6 inches in length, is it necessary to consider their contribution to the load on lateral earthquake braces on the main?

A: Yes, the scenario described is one where the branch lines will not require their own braces but the mains will. The load from the branch lines will still need to be added to the lateral brace loads for the main. The weight of the lines without their own braces will affect the horizontal movement of the piping during an earthquake and should therefore be added.

Upcoming NFSA Technical Tuesday Online Seminar:

NFPA 13 Chapter 10 – Underground Piping

Instructor: Kevin J. Kelly, P.E.

Date: April 19, 2005

Chapter 10 of NFPA 13 on underground piping is shared with NFPA 24 – *Installation of Private Service Mains and Their Appurtenances*. It contains requirements for materials, fittings, joining methods, and aspects of protecting the piping against freezing and mechanical damage, as well as testing and acceptance criteria.

This is the seventh 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.

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

NFSA Tuesday e-Tech Alert is c. 2005 National Fire Sprinkler Association, and is distributed to NFSA members on Tuesdays for which no NFSA Technical Tuesday Online Seminar is scheduled. Statements and conclusions are based on the best judgment of the NFSA Engineering staff, and are not the official position of the NFPA or its technical committees except as noted. Please send comments to Russell P. Fleming, P.E. (fleming@nfsa.org).

In the promotion of the fire sprinkler concept, the National Fire Sprinkler Association represents all fire sprinkler industry interests including fire sprinkler contractors, manufacturers and suppliers of fire sprinklers and related equipment and fire protection professionals. Established in 1905, the National Fire Sprinkler Association provides publications, nationally accredited seminars, representation in codes and standards-making, market development, labor relations and other services to its membership. Headquartered in Patterson, New York, the National Fire Sprinkler Association has regional operations offices throughout the country.