

Best of November 2016

Following are a dozen questions answered by the engineering staff as part of the NFSA's Expert of the Day (EOD) member assistance program being brought forward as the "Best of November 2016." If you have a question for the NFSA EOD (and you are an NFSA member), send your question to eod@nfsa.org and the EOD will get back to you.

It should be noted that the following are the opinions of the NFSA Engineering Department staff, generated as members of the relevant NFPA technical committees and through our general experience in writing and interpreting codes and standards. They have not been processed as formal interpretations in accordance with the NFPA Regulations Governing Committee Projects and should therefore not be considered, nor relied upon, as the official positions of the NFPA or its Committees. Unless otherwise noted the most recent published edition of the standard referenced was used.

Question 1 - Baffles Separating Sprinklers

There is a situation where some sprinklers that are part of a water curtain need to be moved. These relocated sprinklers will be located 5 feet from the adjacent ceiling sprinklers, which are not going to be moved. As these sprinklers are closer than the minimum distance of 6 feet from the adjacent sprinklers, baffles will be installed per section 8.6.3.4.2 of NFPA 13. What is the minimum distance that the baffles may be placed from the water curtain sprinklers?

Answer: NFPA 13 does not specify exactly where baffles are to be located. In this case, as the water curtain sprinklers are not expected to provide floor coverage (this is to be accomplished by the adjacent ceiling sprinklers), the minimum allowed distance between the baffle and the water curtain sprinkler would be 4 inches. This is based upon section 8.6.3.3 which specifies that the minimum distance from sprinklers to adjacent walls is 4 inches.

If the sprinkler in question is expected to provide floor coverage, then the baffle would need to be in conformance with the "beam rule" (section 8.6.5.1.2) in order to ensure that sufficient water will discharge below the baffle.

Question 2 - Using a Restrained Joint System

Is it permissible to use a restrained joint system as an alternative to thrust blocks to secure underground piping from movement?

Answer: Yes, NFPA 13, Section 10.6 permits the use of any of three options; thrust blocks in accordance with Section 10.6.1, restrained joint systems as per Section 10.6.2, or any the specified rigid connection types listed in Section 10.6.3. If a restrained joint system meeting the requirements of Section 10.6.2 and its subsections is used, thrust blocks are not required as the piping will be held in place.

Question 3 - Connecting a Dry Sprinkler in the System



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There is a building where dry sprinklers will be used to protect a few spaces. When connecting the wet pipe fitting can it be located in the wall cavity if a dry barrel length is allowed to be zero?

Answer: "No". The wet pipe fitting cannot be installed in the wall cavity. Figure A.8.4.9.1(a) in NFPA 13 provides guidance on where the dry barrel length is measured from. This figure indicates that the face of the wet fitting needs to be installed outside the wall cavity, and that the exposed dry barrel length (x) is measured from the face of the fitting to the inside surface of the exterior wall. This keeps the wet piping and fittings in areas where the water will not freeze.

Question 4 - Sizing the Fire Department Connection

Some systems have different size diameters for the fire department connection (FDC) and its piping in sprinkler systems. NFPA 13, section 8.17.2.3, provides three options for sizing of pipe. For a sprinkler system that has an 8-inch riser, does the FDC need to be 4 inches or 8 inches in diameter?

Answer: It depends on whether the fire department connection supplies a sprinkler system only or if it supplies a combined sprinkler and standpipe system. The answer is 4-inch if the FDC supplies a sprinkler system riser only, since NFPA 13, section 8.17.2.3 (1) identifies that minimum 4-inch piping is required with fire engine connections. Options 2 and 3 of this section are not applicable to the scenario in question.

If the FDC is also required to meet the standpipe system demand, larger diameter (6-inch or 8-inch) piping may be required to meet the system demand based on NFPA 14 requirements. NFPA 14, section 7.7.1 indicates that the system demand would need to be provided through the fire department connection for Class I and III standpipe systems. NFPA 14, section 7.7.4 identifies that the fire department must be consulted regarding water supply availability from the fire department pumper (engine) when the system demand is to be supplied by the FDC.

Question 5 - Light Fixture in Exterior Projection

NFPA 13-2013, section 8.15.7.3, permits the omission of sprinklers beneath a protected combustible exterior projection having finish materials of noncombustible, limited combustible or fire retardant treated wood in accordance with NFPA 703. Does the installation of a light fixture preclude the permitted omission of sprinklers beneath the projection?

Answer: No. Sprinkler omission is permitted based on the use of the noncombustible, limited combustible or fire retardant treated finish materials. There are no requirements excluding the installation of light fixtures or similar features. Although the opening for the light fixture allows a pathway into the combustible exterior projection; the interior is required to have sprinkler protection, be filled with noncombustible insulation, constructed in a manner limiting spaces to a volume of 160 cubic feet or be less than 55 square feet in area, which are all scenarios of combustible concealed spaces that are permitted to omit sprinklers.

Question 6 - Battery Lifespan

Does NFPA 20 specify the lifespan of batteries used in starting diesel motor fire pumps?

Answer: No, NFPA 20, *Standard for the Installation of Fire Pumps*, does not specify a lifespan for the batteries. Neither does NFPA 25, *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*. NFPA 25 does testing and maintenance of the batteries at specific intervals, but does not set a maximum lifespan of the batteries. A battery's expected lifespan would be discussed in the manufacturer's installation instruction.

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Question 7 - Measuring along the Slope

Figure 8.6.4.1.3.1(b) which illustrates sprinklers under a pitched roof was referenced. Is the distance from the sprinkler to the wall (1/2 S) measured along the slope?

Answer: Yes. Both the distance between sprinklers (S dimension) and the distance from the sprinkler to the wall (1/2 S dimension) are measured along the slope. This concept is found in section 8.5.3.1.2 of NFPA 13 which reads as follows: "The maximum distance shall be measured along the slope of the ceiling."

Question 8 - Sprinklers Near a Ceiling Peak

Standard spray sprinklers are being installed under a sloped ceiling that has a central peak. Do the two sprinklers near the peak of the ceiling need to be installed at least 6 ft apart horizontally?

Answer: Yes. Standard spray sprinklers must be installed at a minimum distance of 6 ft from an adjacent sprinkler to prevent cold soldering. This rule applies to both flat ceiling and slope ceiling applications. This concept has been graphically depicted in NFPA 13 in Figure 8.10.3.6. Although this figure is for residential sprinklers (and the minimum distance is 8 ft) the same concept applies to other sprinklers, there just is not a figure for the other types.

Question 9 - Classifying Commodities with Plastic Packaging

There is a project for a warehouse of rack storage with packaged meats stored in plastic crates. You have indicated that the packaged meats have been classified as a Class III commodity. Specifically, do the plastic crates need to be taken into consideration in regards to the classification.

Answer: Yes. Section 5.6.1.1.1 of NFPA 13 indicates that the "type and amount of materials used as part of the product and its primary packaging as well as the storage pallet shall be considered in the classification of the commodity." Therefore, the packaging would be required to take into consideration the volume and weight of the plastics when considering the commodity classification. The 2016 edition of NFPA 13 also clarified that when considering the percentage of weight or volume of plastics in a commodity, there is a relationship of both that are acceptable and not simply one or the other. For example, it is permissible to have a maximum of 17% expanded Group A plastic by volume with a maximum of 5% unexpanded Group A plastic by weight in a commodity which would allow it to be considered a Class IV commodity. Another example would be if there is the maximum allowed 25% expanded Group A plastic by volume, then it would not be permitted to have any unexpanded Group A plastic by weight in the commodity while maintaining a Class IV commodity classification. This is shown in Figure 5.6.3.3.3(a) of NFPA 13.

Question 10 - Sprinklers in a Breezeway

A building that is being protected in accordance with NFPA 13R within a residential complex is planned. Are sprinklers required to be installed in the breezeway/covered entry of the building?

Answer: No. NFPA 13R does not require sprinklers to be installed in many exterior applications. Section 6.6.5 in NFPA 13R, 2016 Edition is cited below. The annex language also indicates that breezeways are intended to be included in the described spaces where sprinklers are permitted to be omitted. This would also be similar to a covered entry.

6.6.5* Except as provided for in 6.6.5.1, sprinklers shall not be required in any porches, balconies, corridors, carports, porte cocheres, and stairs that are open and attached.

A.6.6.5 An example of an open or exterior corridor, stair, or breezeway is one that is exposed to the outside atmosphere (temperature). Another example is an exterior wraparound



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corridor that is typical in a two- to three-story motel. [See Figure A.6.6.5(a) through Figure A.6.6.5(e).]

6.6.5.1 Where a roof or deck is provided above, sprinklers shall be installed to protect attached exterior balconies, attached exterior decks, and ground floor patios serving dwelling units in buildings of Construction Type V.

Users should be there may be building code requirements for breezeways where fire sprinklers would need to be installed. This is based on separations that are not rated in which sprinklers would be required in a breezeway.

Question 11 - Draft Curtains Separating ESFR Sprinklers from Adjoining Areas

An area is protected with ESFR sprinklers. There is a neighboring area that is Ordinary Hazard. Is a draft curtain required by NFPA 13 between the ESFR area and the Ordinary Hazard area if quick response sprinklers are installed in the Ordinary Hazard area?

Answer: No. As long as quick response sprinklers are installed in the adjoining area, a draft curtain would not be required. The intent of a draft curtain is to separate the areas so that sprinklers operate only on the side that is experiencing a fire incident. If one side has quick response and the other side uses standard response sprinklers there is a risk of opening sprinklers far from the fire source that may result in too many sprinklers being open. Therefore, if the Ordinary Hazard area also uses quick response sprinklers, then a draft curtain would not be required.

In addition, it was questioned if there is an area protected with ESFR sprinklers, but the adjacent hazard is an Extra Hazard occupancy, is a draft curtain required. Again, as long as a quick response sprinkler is used to protect the Extra Hazard occupancy, then a draft curtain would not be required. Of course, with an Extra Hazard occupancy, the sprinklers will have to be specifically listed as quick response sprinklers that are permitted to protect Extra Hazard.

Question 12 - Clearance Near Vertical System Piping

In an area requiring protection from earthquake forces, would a fire sprinkler riser or standpipe near a fire rated wall, such as in a stairwell, need to maintain the 2 inches of clearance referenced for pipe from structural members?

Answer: No. The vertical system piping will have to have appropriate flexibility and bracing as called for in NFPA 13. This will allow it to move with the wall, which along its length it is connected. The real goal is to avoid differential movement such that the pipe and the nearby structure would not collide. When the pipe is supported by that nearby structure (walls or ceiling assemblies), it will move with the structure and impact should not occur. If there are portions of the structure expected to move differently than the system, it is wise to leave a little space.

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