

## Best of February 2024

The following are a dozen questions answered by the NFSA's Codes, Standards, and Public Fire Protection staff as part of the Expert of the Day (EOD) member assistance program during the month of February 2024. This information is being brought forward as the "Best of February 2024." If you have a question for the NFSA EOD submit your question online through the "My EOD" portal.

It should be noted that the following are the opinions of the NFSA Engineering, Codes, and Standards staff, generated as members of the relevant NFPA and ICC 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 or ICC Council Policy #11 and should therefore not be considered, nor relied upon, as the official positions of the NFSA, NFPA, ICC, or its Committees. Unless otherwise noted the most recently published edition of the standard referenced was used.

**FLOODELIMINATOR**  
**SMALL ADDITION**  
**BIG PROTECTION**



## Question #1 - Ball Drip

**NFPA 24 allows an automatic ball drip to be buried and discharged into a bed of crushed gravel. NFPA 25 requires the ball drip to be checked quarterly. If we cannot find the ball drip during our inspection, do we write this up as a deficiency on an NFPA 25 inspection?**

No, the absence of completion of an NFPA 25 inspection or test does not inherently constitute a violation or deficiency within the standard. A deficiency is defined by a discernible issue with a component or system. Failing to conduct an inspection or test implies no proof of a deficiency. However, such negligence may violate fire code regulations, subject to enforcement by the authority having jurisdiction (AHJ).

Automatic drain valves were permitted to be buried until the 2016 edition of NFPA 13. Section 8.17.2.6.1 of NFPA 13 now mandates that automatic drain valves be installed in a manner allowing inspection and testing per NFPA 25. Previous NFPA 13 editions lacked explicit requirements for accessible routine inspection and testing of drain valves. NFPA 25 does not specify procedures for inspecting buried drain valves. In scenarios where a buried drain valve is inaccessible for quarterly inspection, action is deferred until the hydrostatic test of the FDC piping is due. Should the buried drain valve fail, excavation and replacement become necessary. Such an occurrence presents an opportunity to install a road box or implement alternative means for providing proper access to the drain valve.

## Question #2 - Trapeze Hangers and Multiple Pipes

**When designing trapeze hangers to suspend multiple pipes, how should hanger rod size be determined?**

When designing trapeze hangers to suspend multiple pipes, determining the appropriate hanger rod size requires compliance with NFPA 13, 2010 edition, Chapter 9. It is important to note that the prescriptive requirements of NFPA 13 for trapeze hangers typically consider the installation of a single sprinkler pipe per hanger, not multiple pipes.

However, NFPA 13 does not explicitly prohibit the suspension of multiple pipes from a trapeze hanger. Section 9.1.1.2 of NFPA 13 allows for alternative hanger options, subject to review and approval by a registered professional engineer. This involves the design and certification of the hanger assembly to meet the performance requirements specified in Section 9.1.1.2.



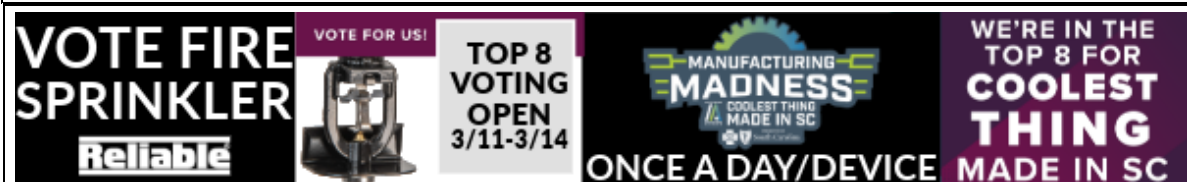
## Question #3 - Listed Air Compressor

**Do we need to have a listed air compressor?**

No, according to NFPA 13, 2013 edition, a listed air compressor is not mandated. Section 6.1.1.5 specifies that certain components, such as drain piping, drain valves, and signs, which do not directly impact system performance, are not required to be listed. This exemption extends to air compressors in dry pipe systems, as their improper operation does not significantly affect the system's ability to discharge water from sprinklers.

However, it is worth noting a forthcoming change is in the 2025 edition of NFPA 13. The second draft of the 2025 edition introduces Section 7.10, which mandates that air compressors dedicated to fire protection in sprinkler systems must be listed. This shift underscores the critical role of air compressors in system performance and aims to ensure their durability and reliability through compliance with recognized product standards.

While the 2025 edition of NFPA 13 is not yet finalized and applicable, it is essential to be aware of the impending requirement for listed air compressors. Therefore, while not currently mandatory, installing a listed air compressor is advisable to align with anticipated future standards and ensure optimal system performance.



## Question #4 - Auxiliary Dry System

**If we have an auxiliary dry system that is fed off a wet system to supply a small buildout of 1,000 square feet, do we need to include an additional 950 square feet from the adjacent wet system to calculate the full remote area, or can we calculate only the 1,000 square feet for the dry system? The addition consists of a separate room with doors.**

Yes, when employing the density/area method, the hydraulic calculations must encompass the entire required design area, incorporating all necessary adjustments, in accordance with NFPA 13, 2016 edition, Sections 11.2.3.2, 23.4.4.2, and 23.4.4.7.

Alternatively, consider utilizing the room design method. In this scenario, the dry pipe system room must be rated as specified in Section 11.2.3.3.3, with openings protected in accordance with Section 11.2.3.3.5. If the room meets the required rating and opening protection criteria, Section 11.2.3.3.1 dictates that the water supply requirements for sprinklers only shall be based on the room with the highest demand. Additionally, Section 23.4.4.1.1 stipulates that for designs based on the room design method, calculations should focus on the room and any communicating spaces that are hydraulically the most demanding.

## **Question #5 - Inside Hose Stream for Sprinklers**

**A fire pump supplies a standpipe system and a sprinkler system. They are separate systems, not combined. Do we add inside hose to the sprinkler system calculations?**

No, when a fire pump serves distinct sprinkler and standpipe systems, inside hose stream demand is not required to be added to the sprinkler system calculations. However, if inside hoses are connected to the sprinkler system as outlined in Section 16.15, the inside hose stream demand must be accounted for. For instance, NFPA 13 permits the addition of small mop-up hose connections to the sprinkler system when mandated by the authority having jurisdiction (AHJ), necessitating the inclusion of inside hose demand. Notably, hose stream demand is not considered for the sprinkler system when it is integrated with a standpipe system. NFPA 13 and NFPA 14 allow each system to be independently designed.

Total hose stream demand, in accordance with Table 19.3.3.3.2, is mandated on the fire pump suction side if it draws water from the public water supply, the same source used by the fire department. However, hose stream demand is not obligatory if the fire pump is supplied by a tank or raw water source.

## **Question #6 - Solid Beam as a Curtain**

**Can a 24-inch-deep steel beam serve as a draft curtain/stop as outlined in Section 11.1.2(2) of NFPA 13-2016 edition-for adjacent hazards?**

Yes, according to the 2016 edition of NFPA 13, Section 11.1.2(2 and 3), which addresses the use of draft curtains for protecting adjacent hazards. A 24-inch steel beam can fulfill the requirement for "physical separation" specified in the standard. However, it is important to note that certain authorities having jurisdiction (AHJ) may require additional measures for the corrugations of the deck. For instance, if the corrugated floor/roof steel rests on top of the beam, some AHJs may mandate filling the void spaces within the corrugated steel with rockwool. Parenthetical statement #2 in the standard emphasizes the performance requirements, stating that the beam should be capable of delaying heat in one area and preventing the fusion of sprinklers in the adjacent area. It is noteworthy that the stuffing of corrugated voids is not explicitly addressed in NFPA 13 and may be considered outside the scope of this particular section

## **Question #7 - Pipe Labeling**

**Does NFPA 13 require pipe labeling with tags or labels other than what is required by the manufacturer?**

NFPA 13 mandates pipe labeling; however, the method of labeling is determined by the manufacturer and its manufacturing standard, as detailed in Table 6.4.1. Specific labeling requirements under NFPA 13 can be found in Section 6.3.11, which outlines criteria for the marking and visibility of labeling on installed piping.

Regarding the use of additional tags or labels, the NFSA (National Fire Sprinkler Association) is unaware of any manufacturing standards that require their utilization beyond those tags or labels installed by the fabrication shop. These additional tags or labels may be removed once the piping is installed.

## Question #8 - Main Drain and Hydraulic Calculations

**Can information from a main drain test be used for hydraulic calculations when a building lacks a pump, and it is too cold to conduct a flow test?**

No, there is no accepted method for using main drain test results to accurately determine the flow rate of the system. Several variables, including assumptions related to the roughness of the discharge line and the utilization of the drain diameter for water discharge, contribute to this limitation.

Some individuals have speculated about using a pitot gauge inserted into the drain outlet to convert velocity pressure readings to flow rates. However, this approach would not yield accurate flow calculations. The formula for converting velocity pressure to flow assumes full utilization of the outlet diameter, which is not consistently achieved with drain pipes. Consequently, it would not provide accurate flow conversions. The primary purpose of the 2-inch drain test is to confirm the integrity of the water supply since the previous test and ensure that system valves are open.

The main importance of the main drain test lies in verifying that valves between the water supply and the sprinkler system are open. Consistent opening of the main drain connection during each test allows comparison of residual pressure from the water supply with previous tests, aiding in the identification of potential issues such as closed valves or obstructed supply pipes.

## Question #9 - System Status after Freezing

**Does NFPA 25 have any guidelines when a fire sprinkler system freezes for testing of sprinklers or replacement?**

Currently, NFPA 25 does not include specific guidelines for addressing frozen fire sprinkler systems.

However, the following steps are recommended as good practice:

1. Ensure the system is completely thawed.
2. Inspect all related sprinklers, pipes, fittings, and components to verify their operational status.
3. Replace any parts or components that appear damaged.
4. Conduct an air test of the system; if no leaks are detected, proceed with a hydrostatic test in accordance with NFPA 13.
5. If leaks are found, repair them as necessary, then repeat the air test until all leaks are resolved before conducting a hydrostatic test, as per NFPA 13 requirements.

Always consult the local authority having jurisdiction (AHJ) for any additional requirements or guidance.

It is important to note that these recommendations are not mandated by NFPA 25 or NFSA. They serve as suggestions for repairing frozen pipes, and alternative methods may also be considered.

## Question #10 - Exterior Opening Protection

**Do we need to protect the exterior opening of the second-floor canopy? The ceiling is limited combustibile, and the rest of the canopy is not sprinklered because it is less than 4 feet. Installing dry pendent sprinkler heads will be a challenge if we need to. Please see attached snips for more info.**

Unfortunately, we do not have enough information to provide a definitive yes or no answer to if sprinkler protection is necessary under this area. You have indicated the ceiling is limited combustibile. However, no indication is given regarding if the projection, overhang, etc. is made of combustibile or non-combustibile materials. The combustibile vs. non-combustibile issue will determine which section in NFPA 13 applies. If the construction materials are combustibile, and the exposed finish surface is limited combustibile, Section 8.15.7.3 may apply.

Unfortunately, we also do not have enough information to determine if Section 8.15.1.2.18.2 applies. It appears based on the image provided, the space at the forefront would be considered an exterior projection. Other areas may meet the definition of an overhang and subject to the requirements in Section 8.15.1.2.18. In other words, it is possible both the exterior projection provisions in NFPA 13 AND the sections dealing with soffits, eaves, overhangs...may be applicable to this situation.

## Question #11 - Stage Hose Valves

**The 2022 California Building Code (CBC), Section 905.3.4 & 905.3.4.1: The CBC references class two hose valves on each side of the stage. Is there any reference in NFPA or other standards that direct the distance or what side is required?**

The 2022 CBC, Section 905.3.4 & 905.3.4.1, specifies the requirement for Class II hose valves on each side of the stage. While the CBC mandates this location requirement, installation guidelines are provided by applicable standards. Neither NFPA 13 nor NFPA 14 includes specific provisions regarding hose connections on stages.

In accordance with the CBC 2022 edition, stages exceeding 1,000 square feet in area must have a Class III standpipe on each side, meeting the installation requirements outlined in NFPA 14 for standpipe systems.

If the building is fully equipped with an automatic fire sprinkler system, only 1 1/2-inch hose connections are necessary. These installations can be carried out in accordance with NFPA 13 (2019 edition) Section 16.15, which addresses 1 1/2-inch hose connections on sprinkler systems.

The exemption in Section 905.3.4 provides guidance on location, requiring hose connections to be accessible for reaching all areas of the stage with 100 feet of hose and 30 feet of spray (130 feet total). The CBC allows distances to exceed these requirements with approval from the authority having jurisdiction (AHJ).

Hose stations are intended for controlling incipient fires on the stage by trained occupants. However, some jurisdictions may exempt this requirement for stages, as both the International Fire Code and NFPA 1- *Fire Code* permit the removal of fire hose and nozzles from 1 1/2-inch hose connections (Class II) with AHJ approval.

## Question #12 - Water Curtain

### Can a fire sprinkler water curtain provide a 1-hour fire rating?

No. The presence of a fire sprinkler system is not a determining factor when constructing a fire-rated assembly.

To elaborate further, the building code mandates that fire resistive assemblies undergo testing in accordance with ASTM E119. This standard specifies the materials required for different fire ratings, such as 1-hour, 2-hour, and 3-hour assemblies. For instance, a single layer of 5/8 inch Type X gypsum board meets the requirements for a 1-hour fire resistive assembly based on ASTM E119 testing. While the building code often grants a reduction in the fire resistive rating when sprinklers are present, the presence of a fire sprinkler system or water curtain alone does not guarantee a 1-hour or 2-hour fire rating for a barrier or wall.

However, it is important to note that listed window sprinklers can provide up to a two-hour equivalency for protecting glazing. Section 703.4 of the International Building Code (IBC) permits this exception, which differs from fire-resistive assemblies.

## Training and Education



### Sign-Up for one of our Layout Technician Pathway Courses

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The LTP consists of two parts. Students must first complete the on-line Part 1: Fundamentals before attending the in-person Part 2: Application session. The 25 self-paced online modules cover everything from "Parts of a Sprinkler" to "Introduction to Fire Sprinkler Calculations." The 3-day in-person instructor-led Part 2: Application class applies the content learned in the previous Fundamentals course. There are four in-person and one virtual session offered in 2023.

**NOTE: Students must register for Part 1: Application at least one month before the start of in-person Part 2: session in order to allow enough time to complete the on-line modules.**

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1-Jul-24	28-Jul-24	July 29-31, 2024	CO
23-Sep-24	11-Oct-24	October 12-24, 2024	Virtual

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