



TechNotes

Editor - Roland Asp, CET

#535

05/14/2024

Best of April 2024

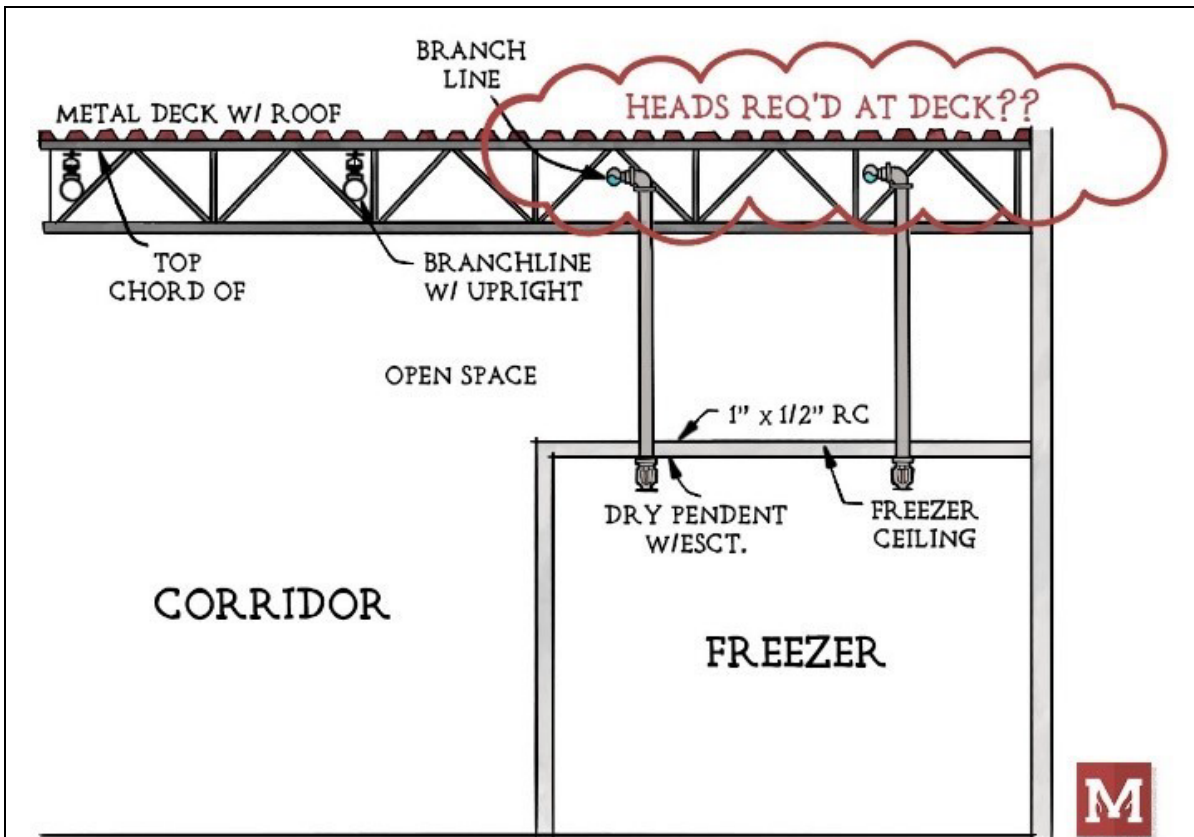
The following are a dozen questions answered by the NFSA's Codes, Standards, and Public Fire Protection staff as part of the Expert of the Day (EOD) member assistance program during the month of April 2024. This information is being brought forward as the "Best of April 2024." If you have a question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

Question #1 – Sprinklers Above Freezers

A project is being protected with sprinklers in accordance with the 2010 edition of NFPA 13. This building includes walk-in freezers that are protected with dry sprinklers. As the floor area is protected, are sprinklers required over the top of these freezers?

Yes, sprinklers are required over the freezer/coolers. Check out Section 8.15.22 (and related subsections) in the 2010 edition of NFPA 13. Section 8.15.22.3 outlines the requirement for sprinklers to extend 0.6 times the square root of the design area of the sprinkler system into the adjacent space. Also see Figure A.8.15.22.3 to further demonstrate the design arrangement.



Question #2 – ESFR Obstructions in Ordinary Hazard

An existing ESFR warehouse occupancy is being changed to ordinary hazard group I occupancy. The owner prefers to keep the ESFR sprinkler heads in place. However, they plan on adding a 2-foot-wide duct run 10 feet below the ESFR sprinkler heads. Is there any relief in the 2016 code to not allow sprinkler heads under this duct work (as it does in the NFPA 13 2022)? Or would the duct have to still be located 2 feet from side of ESFR sprinkler head(s)?

Based on the requirements in the 2016 edition of NFPA 13 the spacing and obstruction criteria for the ESFR sprinklers still apply even when protected light and ordinary hazard occupancies. The allowance to apply the spacing and obstruction criteria for spray sprinklers (chapter 10) was not added until the 2022 edition. With that said it is not uncommon for an AHJ to permit the use of the most current edition of NFPA 13 especially when the specific criteria in question didn't exist in the adopted edition. If the AHJ approves the use of the 2022 criteria the obstruction described can be avoided.

Question #3 – Extended Coverage Sidewall Sprinklers Installed Back-to-Back

Can Extended coverage sidewall sprinklers be installed back-to-back with a baffle in accordance with Section 11.3.4.4? This method would mandate a baffle that is 8 inches long and 6 inches wide.

No. In our opinion, a baffle installed per section 11.3.4.4 is not continuous as required by Section 11.3.4.1.4. This section requires that Extended coverage sprinklers that are installed back-to-back be separated by a “continuous lintel, soffit, or baffle.”

It needs to be noted that the purpose of the continuous lintel, soffit, or baffle is twofold. The soffit or baffle ensures that the sprinkler nearest the fire operates and ensures sprinklers on both sides of do not operate simultaneously. For example, if a fire occurs on one side of the partition, the sprinkler on the other side of the partition (spraying away from the fire) should not operate. This would not be of any benefit and will only take pressure away from the needed sprinkler. Additionally, sidewall sprinklers are designed to discharge a portion of their spray behind the sprinkler, so without a separation, one sprinkler discharging could cause cold soldering of the adjacent sprinkler. Obviously, if the sprinkler facing the fire area does not operate due to the spray of the adjacent sprinkler, the fire may not be contained.

Based upon the above, a simple baffle in accordance with 11.3.4.4 would not be sufficient to trap the heat to ensure the correct sidewall sprinkler activates. It is our opinion that the separation between the back-to-back sprinklers be continuous (across the bay) and installed tight to ceiling so that the heat from a fire can be captured.

Finally, while not in extended coverage chapter (Chapter 11), it should be noted that section 10.3.4.1.4.2 for standard spray sidewall sprinklers does mandate that the separation between back-to-back sidewalls project a minimum of 4 in. (below the deflector).



Question #4 – QR Area Reduction and Room Design in FM

Does FM permit the Quick Response Area Reduction or the room design method for hydraulic calculations?

No, Factory Mutual (FM) data sheets do not provide for quick response sprinkler design area reduction and/or the room design method as NFPA 13 does. FM Data Sheet 3-26 for non-storage occupancies Section 2.3.1.10 and Table 2 for HC-1 and a wet pipe sprinkler system, does provide note 1 which indicates the demand area for dormitories, residential, and dwelling type areas may be based on the largest room area, but not less than four sprinklers provided fire compartmentation with a minimum one-hour fire rating is present.

Question #5 – Water Tank Critical Levels

Section 14.9 of the 2023 edition of NFPA 22 states that provisions must be provided for sensors for two critical water temperatures, two critical water levels, and two critical pressure readings for pressure tanks only.

What are these critical levels?

The critical levels mention in Section 14.9.1 are identified in Section 14.9.2 and are as follows:

Critical Water Temperatures:

- Water temperature below 40°F - Section 14.9.2(1)

- Return of water temperature to 40°F - Section 14.9.2(2)

Critical Water Levels:

- Water level 3 in. (pressure tanks) or 12 in. (all other tanks) - Section 14.9.2(3)
- Return of water level to normal - Section 14.9.2(4)

Critical pressure readings (for pressure tanks only):

- Pressure in pressure tank 10 psi below normal - Section 14.9.2(5)
- Pressure in pressure tank 10 psi above normal - Section 14.9.2(6)

Spring WEBINAR SERIES

SERIES OF 1.5 NICET CPD WEBINARS

Fire Protection Air Supply Decisions and Corrosion Mitigation in Dry and Pre-action Fire Sprinkler Systems

training.generalairproducts.com

April 9th to May 24th REGISTER

GENERAL AIR PRODUCTS

Question #6 - Rod Run Down to Pipe

A system has pressures that exceed 100 psi. Section 9.2.3.4.4 in the 2013 edition of NFPA 13 requires that for unsupported lengths, the end sprinkler has a hanger that prevents upward movement.

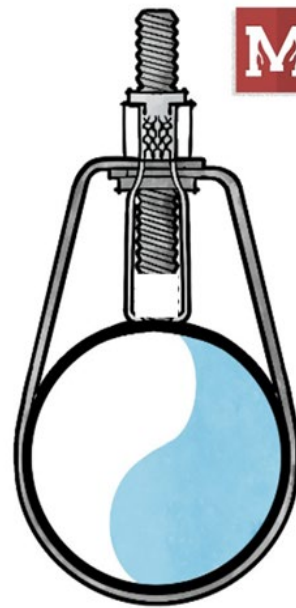
Is running an all-threaded rod all the way down to the pipe an acceptable method to prevent upward movement of the pipe?

Yes, as detailed in Annex figure A.9.2.3.4.4(b), running the hanger rod tight to the piping is one method to avoid upward movement for the end-of-line pendent sprinkler. Hanger manufacturers also make available restraining or surge clips that can fill the void and restrain the pipe from moving upward.

This annex figure shows examples of acceptable hangers for preventing upward movement.



ADJUSTABLE SWIVEL RING – ROD TIGHT TO PIPE



ADJUSTABLE SWIVEL RING WITH SURGE SUPPRESSOR

Question #7 – Fire Pump Starting Time and Transfer Times

What is the max allowable startup time for a fire pump? Also, what is the max time allowable for transfer to backup power?

We are not aware of an allowable startup time for a fire pump. NFPA 20, 2022 edition, Section 10.5.2 for automatic controllers requires the fire pump to activate based on pressure drop and not a specific time. If the system has a pressure drop of 5 psi below the jockey pump start pressure, the fire pump is required to immediately automatically start. Again, we are not aware of a required time limit for this automatic pressure activation.

NFPA 20, 2022 edition, Section 14.2.8 for alternate power supply indicates on installations with an alternate source of power and an automatic transfer switch, loss of primary source shall be simulated, and transfer shall occur while the pump is operating at peak load. The handbook commentary explains when the primary power source is interrupted while flowing at 150 percent of rated pump capacity, the transfer switch and the alternate power source should be achieved within 10 seconds, and the peak flow should be successfully redelivered within 20 seconds to 30 seconds.

Question #8 – Exterior Stairwell

There is a noncombustible (concrete and steel) exterior stairwell with exterior wall having a non-combustible brick finish on a rated wood wall. The stairwell is over 50% open.

Is the intent of Section 9.3.4.2.4 of the 2019 edition of NFPA 13 to allow omission of sprinklers on this stairwell? Or are sprinklers required as the building itself is of combustible construction?

The intent of this Section is that the entire construction of the stair tower itself is noncombustible.

NFPA 13, 2019 edition, Section 9.3.4.2.4 indicates sprinklers shall be permitted to be omitted from exterior stair towers when the exterior walls of the stair tower are at least 50 percent open and when the stair tower is entirely of noncombustible construction.

In this case, as long as the stair tower itself is 50% open and entirely noncombustible construction, the attached building could be of combustible construction.

Question #9 – UL Listed Antifreeze and Tented Piping

Does NFPA 13 allow a combination of tenting insulation and UL listed antifreeze as a method to meet freeze concerns?

Yes, a combination of tenting and antifreeze would be an acceptable solution to protect against freezing. There is nothing specific in NFPA 13 that makes this a violation.

Question #10 – UL Listed Antifreeze in Existing Systems

What is the requirement(s) or guidance for systems that exceed the maximum volume requirements of UL listed antifreeze per the manufacturer's listing? Is it the intent to require system to be split with additional risers?

The 2023 edition of NFPA 25, according to Section 5.3.4.4.1, permits the use of listed antifreeze solutions beyond the limits for which they were originally approved. The purpose of this provision, as elaborated in Annex A.5.3.4.4.1, is to facilitate the transition from legacy antifreeze solutions like propylene glycol and glycerin to newer listed antifreeze solutions in existing systems that may not conform to current volume and specific requirements for hydraulic design criteria, provided that the required freeze protection temperature is within the listing limits of the new antifreeze solution.

For the 2026 edition, currently under development, the draft changes integrate the system volume limit into the enforceable rules. As per the first draft (see FR-27), the language suggests that while replacing non listed antifreeze solutions with listed alternatives, it is permissible, subject to approval by the Authority Having Jurisdiction (AHJ), to use these solutions outside their designated system volume and hydraulic calculation requirements, as long as the operational temperature ranges are not exceeded. Here is the (also attached) first draft language:

“Where acceptable to the AHJ, listed antifreeze solution used to replace non listed antifreeze solutions shall be permitted to be used outside their system volume and hydraulic calculations requirements if the temperature ranges are not exceeded.”

In summary, the intent of these regulations does not necessarily require the system to be split with additional risers to accommodate the volume restrictions of listed antifreeze. Instead, it allows for the use of listed antifreeze in larger systems than specified by their listing, contingent upon AHJ approval (in the 2026 version, the 2023 does not seek the AHJ approval), thereby maintaining the integrity of existing systems without mandating reductions in system size. This approach is documented with the intention of keeping existing systems operational while transitioning to safer, listed antifreeze solutions.

Question #11 – Fire Protection System for Mosque Minaret

A project consists of providing a sprinkler system in a mosque. The mosque includes four minarets which are proving difficult to install sprinklers.

Are sprinklers required in these spaces?

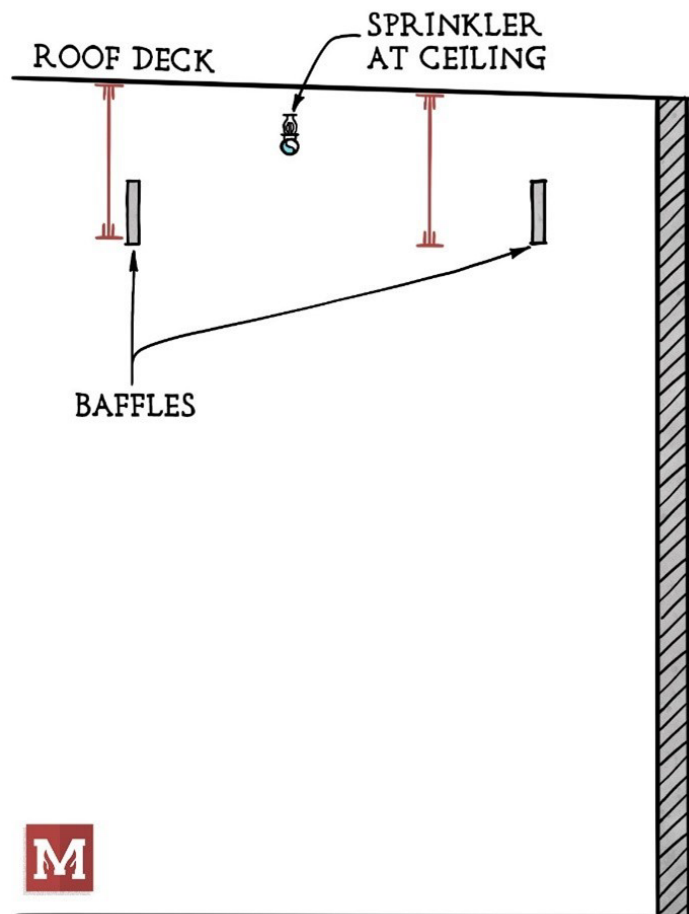
NFPA 13, 2022 edition, Section 9.1.1 for the basic requirements for the location of sprinklers indicates sprinklers shall be installed throughout the premises. This section sets the basic premise that sprinklers shall be installed throughout the building unless there is a specific allowance in the standard to omit sprinkler protection. There is no section stating that sprinklers can be omitted from spaces like minarets or church steeples.

Section 9.2 provides the allowable sprinkler omission locations. It may be possible, based on the details of the construction and access to the space, that the minaret meets one of the conditions found in section 9.2.1 that would allow sprinklers to be omitted from concealed spaces.

Question #12 – Baffle Obstruction

In an ordinary hazard occupancy, suspended ceiling baffles are present as shown in the figure below standard spray upright sprinklers. As the baffles are not structural and are located below the upright sprinklers, can the three times rule be ignored as noted in Section 8.6.5.2.1.4 of the 2016 edition of NFPA 13?

Yes, since the baffles are completely below the sprinklers, water from the sprinklers will get to two sides of the baffle. Therefore, the baffles can ignore the “three-times” rule per Section 8.6.5.2.1.4 since baffles are not structural members. The answer would have been different if the baffle was tight to the ceiling or if the top of the fixture was above the plane of the deflector. The installation as shown appears to be compliant.



Training and Education



Sign-Up for one of our Layout Technician Pathway Courses

NFSA's newly updated fire sprinkler Layout Technician Pathway (LTP) prepares fire sprinkler layout and design professionals for NICET Levels I & II certifications. It also provides a great refresher for those who have been designing systems but need a comprehensive refresher. Students will receive a hard copy of the recently updated and revised "Layout Book" as well as a copy of the 2022 edition of the NFPA 13 standard.

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.

Layout Technician Pathway cost:

Members: \$2,200.00

Non-members: \$4,400.00 – [Join here](#) to save 50%!

Registration Deadline for Fundamental & Application	Layout Technician: Fundamentals Completion Deadline	Layout Technician: Application Class Dates	Location
1-Jul-24	28-Jul-24	July 29-31, 2024	CO
23-Sep-24	11-Oct-24	October 12-24, 2024	Virtual

[Check Out All Options Here](#)

[Click Here to See All Learning & Development Opportunities](#)

The National Fire Sprinkler Association is proud to present our NEW 2019-2020 Edition EOD Handbook

The EOD Handbook is now a three-volume set of over 1,500 pages covering hundreds of topics that are relevant to automatic fire sprinkler systems, standpipes, water supplies, inspection, testing and maintenance, codes, and standards.

Order the latest volume, the 2019-2020 Edition, as a single book or order the three-volume set!



National Fire Sprinkler Association

514 Progress Dr, Ste A,
Linthicum Heights, MD 21090
1-800-683-NFSA (6372)



National Fire Sprinkler Association
514 Progress Dr. Ste A Linthicum Hts, MD 21090
1-800-683-NFSA (6372)
[Manage my Preferences](#)

© 2024 Microsoft Dynamics. All rights reserved.
National Fire Sprinkler Association 514 Progress Drive Suite A Linthicum Heights, MD 21090
[Unsubscribe](#)