NFSA NATIONAL FIRE SPRINKLER ASSOCIATION
The Voice of the Fire Sprinkler Industry

TechNotes

Editor - Roland Asp, CET #519 09/12/2023

Best of August 2023

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 August 2023. This information is being brought forward as the "Best of August 2023." 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.

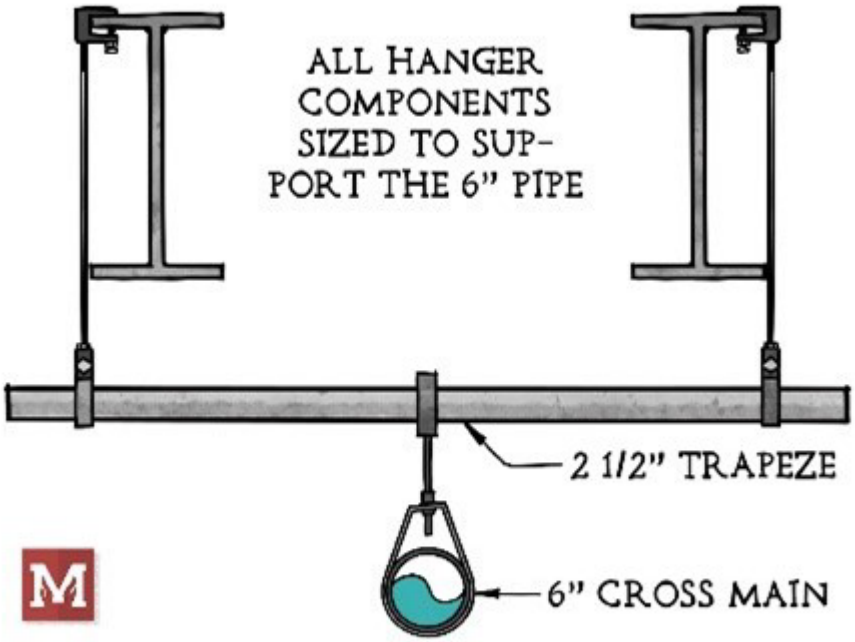
Question #1 – Trapeze Hanger Question

When hanging 6-inch pipe on trapeze hangers it is understood the rod from the 2 ½ inch trapeze bar to the 6-inch pipe is required to be ½ inch rod.

What size of rod must be used for fastening the 2 ½ inch trapeze bar to the steel structure?

When hanging 6-inch sprinkler pipe with a 2 ½ inch trapeze hanger, the hanger rod for both the 2 ½ inch trapeze bar to the structure and the 6-inch sprinkler pipe to the trapeze hanger are both required by the standard to be ½ inch.

NFPA 13, 2022 edition, Section 17.3.5 indicates all components of each hanger assembly that attach to a trapeze member shall conform to 17.1.6 and be sized to support the suspended sprinkler pipe. The key language here is that all components of the trapeze hanger assembly shall be sized based on the size of the suspended sprinkler pipe. Section 17.2.1 for hanger rods, requires 6-inch pipe to be supported by ½ inch diameter rod, therefore the standard requires the hanger rod for both the 2 ½ inch trapeze bar to the structure and the 6-inch sprinkler pipe to the trapeze hanger to be ½ inch.



Question #2 – NFPA 14 Definition of "Adjacent"

2019 NFPA 14 section 7.11.1 requires a drain riser to be installed "adjacent" to facilitate testing of PRV hose valves.

What is the definition of adjacent in linear feet?

NFPA 14 *Standard for the Installation of Standpipes and Hose Systems* does not define the word adjacent, nor does it prescribe a linear distance requirement for pressure-reducing valve (PRV) test drains. Section 7.11.1.1.1 does require a test connection, to be located on a drain used for PRV testing, to be located at a minimum of every other floor of a stairwell.

This leads to the intent of the drain, which is to have a dedicated drain, capable of handling the full flow, adjacent to each standpipe, equipped with test connections. This is well explained for direct-acting PRV's within the required stairwell but not specifically addressed when PRV's are used at horizontal exits.

When a term is not defined in the standard, Merriam-Webster's Collegiate Dictionary, 11th edition, can be the source for ordinarily accepted meaning. They define adjacent as not distant or nearby.

Pressure-regulating devices, both reducing (PRV) and restricting (PRD), have been required to be flow tested every five years, long before the requirement for adjacent drains. Prior to the requirement for drains and even after, it has been an acceptable practice to utilize hose, run to test connections, to facilitate testing.

Without a specific requirement for riser drains or test connections at the horizontal exit, it would be reasonable to use hose, to connect to an adjacent required stairway drain, sized appropriately for flow.

Authority Having Jurisdiction (AHJ) consultation is required in Section 5.1 General, for system type, class, and special requirements. If additional distances or other extenuating situations exist, consultation with the AHJ to provide a reasonable solution would be warranted.

Question #3 – Sprinkler Coverage S x L vs. Data Sheet for Extended Coverage Sprinklers

NFPA 13 (2016) requires the sprinkler hydraulically calculated coverage area to be determined by multiplying the greater (L) distance by the greater (S). However, extended coverage sprinkler data sheets, the noted (L) & (S) values are identical to determine the minimum psi & gpm.

For example, an LH extended coverage sprinkler is covering 18' (L) x 14' (S) for a total of 252 square feet x 0.1 density. This would equal a flow of 25.2 gpm. However, the manufacture data sheet criteria show only a 14x14 (30 gpm) or 18x18 (33 gpm).

Do I use the manufacture higher criteria or the 25.2 gpm?

The listing requirements, i.e., spacing from the manufacturers cut sheet, will supersede the NFPA 13 standards.

NFPA 13, Table 8.8.2.1.2 does give the maximum protection area of each sprinkler, but the S x L comes from the manufacturers data or cut sheet. The S x L listing of extended coverage upright and pendent sprinklers are always in even increments and are square in shape (14x14, 16x16, 18x18, etc.). Sidewall extended coverage sprinklers are always in even increments but are rectangle in shape (12x16, 12x18, etc.). It is possible, for example, to have different spacing than the pendent square, like say an actual spacing of 12x16, but the spacing from the cut sheet (16x16) would need to be used.

Question #4 – NFPA 25, Section 14.2 Clarification

For the internal assessment of piping, NFPA 25 refers to alternate nondestructive measures as referred to in section A.14.2.1.1.

What other methods are acceptable?

Annex Section A.14.2.1(b) provides some examples of nondestructive methods for internal assessments. The section provides examples such as but not limited to video cameras, water sample testing, and ultrasonic testing.

Care should be taken to read each of these methods as some of these methods may or may not meet the intent of the internal assessments. For example, ultrasonic testing will tell the thickness of the pipe wall but may not pick up on any debris inside the pipe.

Other methods may be acceptable but should be approved by the AHJ.

Question #5 - S x L Dimension for Sidewall Sprinklers

A room with combustible ceiling finishes is to be protected with sidewall sprinklers. Table 10.3.3.2.1 in the 2022 edition of NFPA 13 indicates that the maximum "S" dimension of this situation is 14' and the maximum "L" is 12'.

Which of the two dimensions is associated with the throw outward (directly away) from the sprinkler?

The L dimension is defined as the throw outward (directly away) from the sprinkler. The S dimension is defined as the lateral dimension (to the left/right) of the sprinkler.

NFPA 13, 2022 edition, Section 10.3.3.1.1 for the protection area per standard sidewall spray sprinklers indicates that along the wall, the distance between sprinklers along the wall (or to the end wall or obstruction in the case of the end sprinkler on the branch line) upstream and downstream, is defined as the S dimension.

Across the room, the distance from the wall on which the sprinkler is installed to the wall opposite the sprinklers or to the midpoint of the room where sprinklers are installed on two opposite walls (see 10.3.4.1.5 and 10.3.4.1.6) is defined as the L dimension.

Question #6 - Stock of Spare Sprinkler

The 2016 edition of NFPA 13 for stock of spare sprinklers states that for facilities with over 1000 sprinklers, the minimum we need to provide is 24 spare sprinklers.

If a project has 50,000 sprinklers, is 24 spare sprinklers all that is required?

Yes, the minimum of 24 sprinklers is all that is required with appropriate spare wrenches for each type of sprinkler as well. The standard states when there are more than 1000 sprinklers installed, then there shall be no less than 24 spare. There is no minimum requirement for each type of sprinkler, such as two of each, to be placed in the spare head cabinet; however, this is a recommendation in the Annex. Additional spare sprinklers can be provided but are not required.

Question #7 – Travel Distance + Hose Stream

NFPA 14 (2019) and the Canadian Building Code (CBC) (2022) Section 905.4 (6), the more stringent fire hose connection travel hose length is 150 feet to the most remote portion of the floor.

Does NFPA 14 or CBC permit the use of a 30-foot hose stream in order to reach the most remote portion of the building if the hose length alone is not sufficient to reach?

No, NFPA 14 and the CBC allowances for travel distance are 200 feet for a building protected throughout with fire sprinklers and 150 feet for a partially or un-sprinklered building, to the most remote portion. Hose spray is not considered part of the measurement of travel distance in Section 905.4 (6) of the CBC.

The 100 feet of fire hose with an additional 30 feet, for a total of 130 feet, applies to horizontal exits and exit passageways and is only applicable to Section 905.4(2) & (3) of the CBC.

Question #8 – Existing Upright Sprinklers Above Ceiling

If there is existing upright protection in a non-combustible ceiling tenant office space and new ceilings and walls are being installed, by code can the upright protection remain above ceiling, or should the outlets be plugged?

Yes, the existing sprinkler protection above the ceiling in the non-combustible concealed space can remain if it complies with the standard. NFPA 13 is a minimum installation standard. As such, additional sprinkler protection above the minimum requirements of the standard can be provided, if it is designed, installed, and tested in accordance with the standard.

NFPA 13, 2016 edition, Section 1.1.1 for administration and scope indicates this standard shall provide the minimum requirements for the design and installation of automatic fire sprinkler systems and exposure protection sprinkler systems covered within this standard. There is no provision that would prohibit an installation above or beyond the minimum requirements of the standard such as sprinkler protection for a non-combustible void space when it is properly installed.

It is common for multi-tenant office and retail occupancies to install and maintain sprinkler protection above a lowered ceiling in a non-combustible void space to maintain protection when tenant improvement projects are constructed that remove existing lowered ceilings.

Question #9 – Control Valve Supervision

NFPA 13 (2016) requires control valves to be supervised, OR locked in the correct position, OR secured within a fenced enclosure.

NFPA 25 (2017) Chapter 13.3.1.3 specifies that control valves shall be secured by means of a seal, OR a lock, OR electrical supervision.

Question 1: During an inspection per NFPA 25, does a valve secured by seal only meet the intent of securing a valve per NFPA 13 and 25?

Question 2: If a control valve is located within a room behind locked doors not accessible to the public, does this meet the intent of securing the valve per NFPA 13?

Two questions were asked which will be answered separately.

Answer to Question 1: No, unless the valve in question is located in a fenced enclosure and inspected weekly. Section 13.3.1.3 of the 2017 edition of NFPA 25 states that the valve must be secured (locked, sealed or electrically supervised) in *“accordance with the applicable NFPA standard.”*

As the applicable standard is NFPA 13 (2016), section 8.16.1.1.2.1 gives four options for supervising the control valves. The only acceptable use of a seal is found in 8.16.1.1.2.1 (4)

which allows the valves to be sealed only when the valve is located in a fenced enclosure under the control of the owner and is inspected on a weekly basis.

Answer to Question 2: No. As stated above, Section 8.16.1.1.2.1 is the applicable section in NFPA 13 (2016). This section does permit the valve to be locked in the open position (8.16.1.1.2.1 (3)); however, this section specially states that the valve itself must be locked. There is no provision in this section to simply install the valve in a locked room.

The annex to Section 8.16.1.1.2.1 does go into this concept in quite a bit detail.

It should also be noted that most building codes do require that valves controlling the sprinkler system be electrically supervised.

Question #10 – Sprinkler Omission in Bathrooms 55 Square Feet or Less

Can you please provide clarification and examples on the "15-minute thermal barrier rating"?

A single ½ layer of sheetrock is sufficient for the 15-minute thermal barrier required by NFPA 13 (2022) Section 9.2.4.1.1.

The primary goal is to protect the concealed space of the wall itself. The primary concern is that if the fiberglass tub burns, the hot gases will get into the concealed space and the heat could rise to ignite the next floor above. So long as there is a single ½ inch layer of sheetrock on the bathroom side of the stud wall, the 15-minute thermal barrier requirement will be satisfied.

Question #11 – Listed Intumescent Paint for Exterior Wood Projection

Can Intumescent Paint be used to omit sprinklers under Exterior Wood Projection?

No, Section 8.15.7.2 in the 2013 edition of NFPA 13 requires fire retardant treated wood in accordance with NFPA 703. Section 4.1.1 in NFPA 703 requires the wood to be impregnated with a chemical through a pressure process or another method “during manufacture”. The annex to this section clarifies that *“Impregnation is a process whereby the treatment permeates beyond the surface, while coating is a surface treatment.”*

Based upon the data sheet provided, the product is a coating which does not meet the requirement in Section 4.1.1 of NFPA 703. Aftermarket products applied in the field do not meet the criteria in NFPA 703, therefore, do not comply with Section 8.15.7.2 in NFPA 13.

Section A.15.1.2.11, which is applicable to concealed spaces, supports this concept by saying, *“the allowance to omit sprinklers for fire retardant-treated wood requires a pressure-treated application. It does not apply to coated applications.”*

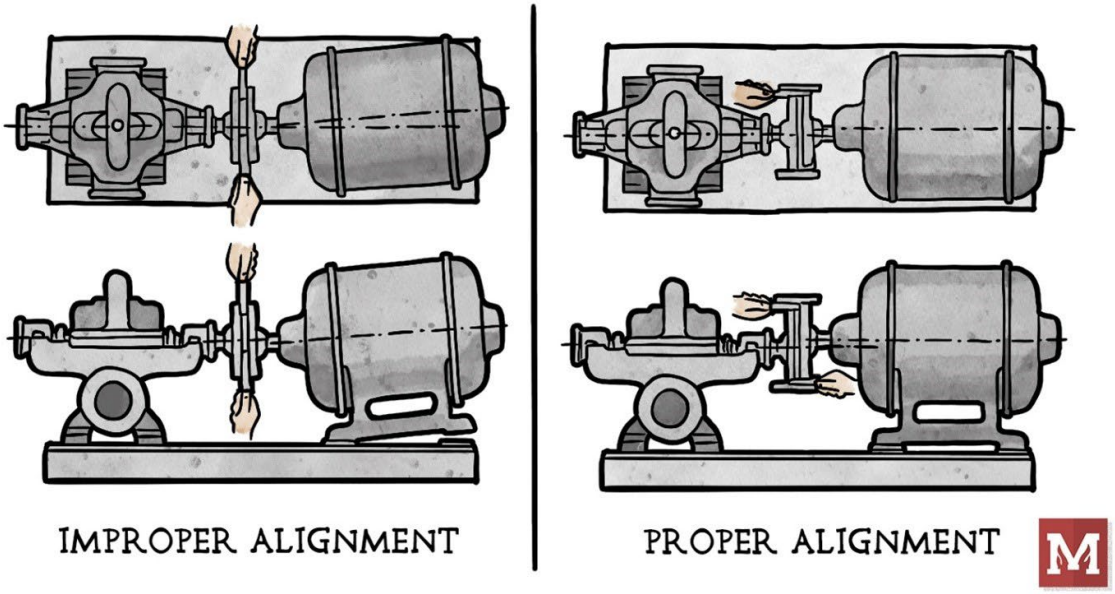
Question #12 – Pump Alignment

The 2020 edition of NFPA 25 in section 8.3.6.4 states that the “…. alignment of the pump and driver shall be inspected during the annual test, and any misalignment shall be corrected.”

Since this is in the "inspection" section of NFPA 25, should it be a visual only inspection of the alignment? Then if there is an issue with the visual inspection, we would proceed to the steps as stated in A.8.3.6.4 to physically check the alignment? Or is the physical alignment as stated in A.8.3.6.4 required to be checked/completed during every annual fire pump inspection?

The intent of the alignment includes removal of the coupling guard for the purpose of inspecting/checking angular and parallel alignment annually during the fire pump flow test. This is a very important inspection/check and must be completed annually to not cause damage to the fire pump assembly.

The annex states that this is a check not an inspection, the alignment is stated as an inspection in the body as the task does not require information to be recorded and compared to previous results as testing does and a check is not defined in the standard. Shuttering and abnormal noise could be an indication or improper alignment but there could also be other factors. Improper alignment could result in the pump components separating and causing catastrophic failure and impairment of the system as well as could cause injury to the technician(s).



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October 14, 2023	November 13, 2023	November 14-16, 2023	MD
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February 20, 2024	March 18, 2024	March 19-21, 2024	Online

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