

Best of September 2022

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 September 2022. This information is being brought forward as the "Best of September 2022." 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 recent published edition of the standard referenced was used.

Question #1 – Exterior Projection with Occupancy Above

Are sprinklers permitted to be omitted under the exterior non-combustible projections with the occupancy above in accordance with the 2013 edition of NFPA 13?

Yes, as long as the construction of the exterior projection meets the requirement of 8.15.7.2, sprinklers are not specifically required by NFPA 13 due to the presence of an occupied floor above. This answer, however, needs clarification.

The annex note associated with this section does state that sprinklers should be provided in areas under exterior ceilings where there is occupancy above. As this is found in the annex of the document it is not enforceable and is not a requirement of NFPA 13. The owner and the responsible design professional should be consulted in this instance and the building code requirements would need to be reviewed.

Additionally, it should be noted that the technical committee responsible for NFPA 13 has addressed this concept in the subsequent editions of NFPA 13. In the 2019 edition of NFPA 13, the annex language noted above was removed with the committee stating that the annex should not suggest that sprinklers are required under exterior projections where there is a floor above as this is an issue dealt with by the building code. It should also be noted that in the 2022 edition of NFPA 13, a new section was added (9.2.3.2.1) which specifically requires sprinklers for "porte-cocheres that are located directly below floors intended for occupancy."



Question #2 – NFPA 13D Townhouse – Sprinkler Main Penetrating Walls

There is a 6-unit townhome building platted on individual lots. Is it permissible in accordance with the International Residential Code for the service main to run from one end of the building to the other end penetrating all the party walls/property lines?

Yes, this arrangement is allowed by the 2021 edition of the International Residential Code (IRC). The IRC allows fire sprinkler piping to penetrate common walls and double walls in townhomes. Section R302.4.1 addresses through penetrations of fire-resistance rated walls or floor assemblies. NFSA added an exception to the IRC allowing water-filled sprinkler piping to penetrate the fire separations provided the annular space is filled with a material complying with condition 1.2 in Exception #1.

This exception requires the material to comply with ASTM E119 or UL 263 time temperature fire conditions under a positive pressure differential of not less than 0.01 inch of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

Additionally, an annex diagram was added to the 2019 edition of NFPA 13D to illustrate this concept. Annex figure A.6.2(e) illustrates an acceptable arrangement for townhouses and shows a single feed main serving each individual unit. A note on this figure clarifies that this feed main can be run “at the exterior or within the building.”

Question #3 – NFPA 25 Ice Obstruction Versus Assessment of Internal Condition of Piping

Does the annual ice obstruction inspection for a freezer preaction system found in section 14.4 of the 2014 edition of NFPA 25 satisfy the requirements of the 5-year Assessment of Internal Condition of Piping outlined in 14.2?

Additionally, does utilizing an air dryer or nitrogen for the preaction system air supply change the assessment requirements of 14.2?

No, the annual ice obstruction investigation does not meet the requirements of the internal assessment as these are two different requirements from different sections of the standard. Also, using air dryers or nitrogen does not have any effect on the internal assessment requirements.

Question #4 – Underground CPVC Thrust Blocks

Do solvent welded joints on listed CPVC pipe qualify as a restrained joint system in accordance with 10.6.2 of NFPA 24 (2019) to not require thrust blocks?

CPVC underground pipe (with solvent-cemented joints) does not specifically fall under section 10.6.2 “Restrained Joint Systems;” however, they do not require additional thrust blocks.

Section 10.6 of the 2019 edition of NFPA 24 is titled “Restraint” and is the charging statement for the restraint requirements. This section states that all underground piping needs to be restrained in accordance with one of three methods which are outlined in sections:

1. 10.6.1 – Thrust Blocks
2. 10.6.2 – Restrained Joint Systems
3. 10.6.3 – Other methods.

CPVC with solvent cemented joints falls under section 10.6.3 which states that additional restraint (such as thrust blocks) is not required where the pipe is joined by one of the following methods (and will not shift during the hydrostatic test.)

1. Threaded Connections
2. Grooved Connection

3. Welded Connections
4. Heat-fused Connections
5. Chemical or solvent cemented connections

CPVC with solvent-cemented joints meets subsection (5) of 10.6.3 and as such additional restraints (thrust blocks) are not required. In fact, the annex section to 10.6.3 specifically states that CPVC piping with solvent-cemented joints are considered restrained and do not require thrust blocks.



Question #5 - Pressure Reducing Valve Flow Testing

What does NFPA 14, 2019 edition, mean when requiring “full flow testing” of pressure reducing hose valves? And is there a different volume required for PRVs versus standard hose valves?

A standpipe system is required to be simultaneously flow tested from the hose connections to verify each standpipe meets the requirements for flow and pressure found in Section 7.8 and 7.10. This is done by simultaneously flowing each standpipe to the required flow and verifying that the most remote outlet meets the required design pressure of 100 psi.

Each standard hose valve is required to be manually operated to its full range, opened, and closed. There is no specific flow test requirement for standard hose valves (Section 11.6)

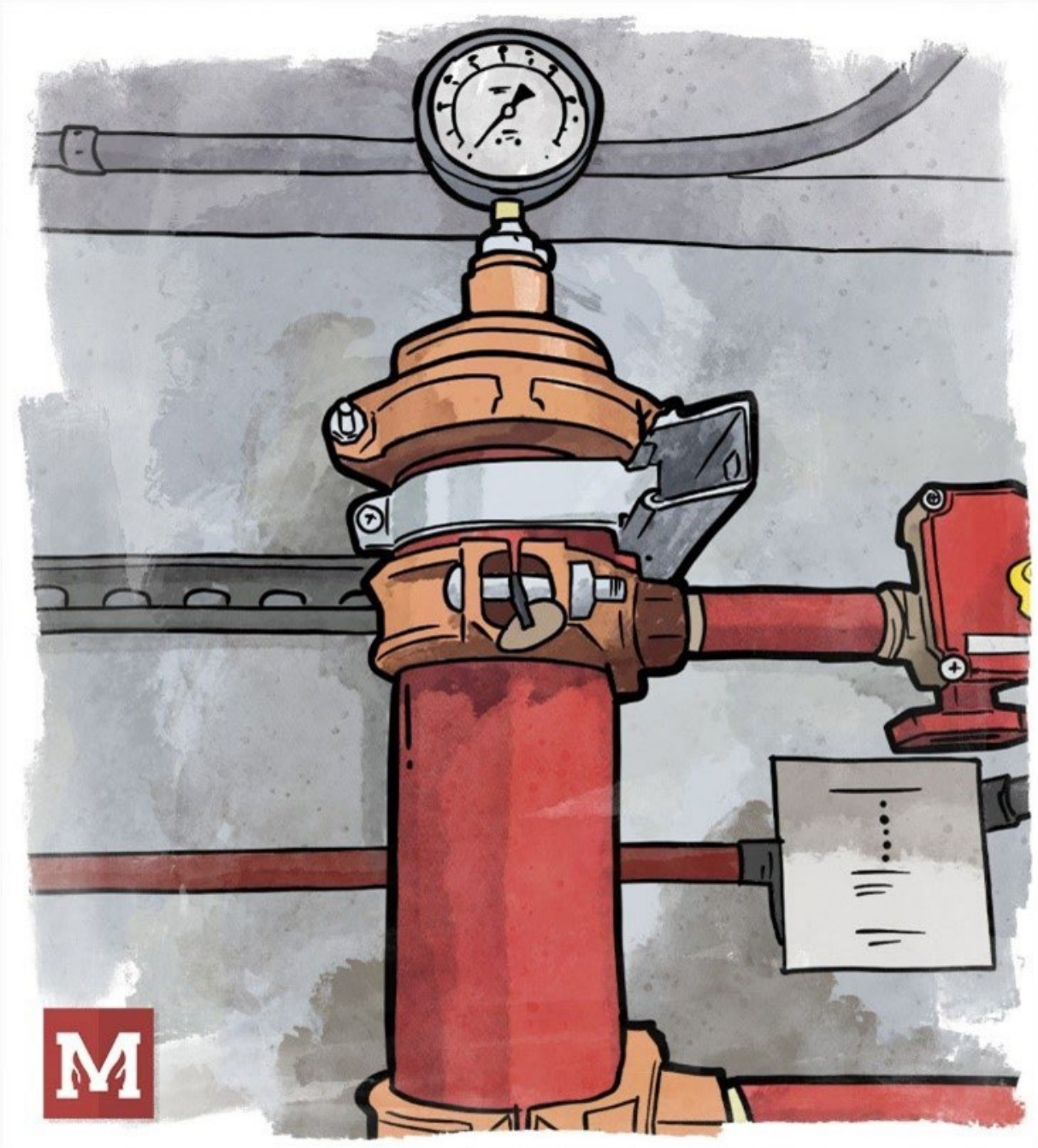
Pressure-regulating devices are to be independently tested to verify that the installation is correct and that the inlet and outlet pressures are in accordance with the design. The static and residual inlet and outlet pressures are to be recorded on the test certificate. (Section 11.5.5)

Question #6 - Gauges for Dry Standpipes

There is no pressure in the dry standpipe except for when they are energized by the fire department. Are gauges required at the top of dry standpipes that are fed solely from fire pumper trucks? If they are required, are they required at the top of every standpipe riser?

Yes, the 2016 edition of NFPA 14, Standard for the Installation of Standpipes and Hose Systems, Section 5.5.1 requires all standpipes to have a gauge at the top of each riser. However, the standard does provide an allowance to install a single gauge where multiple standpipes are interconnected near the top.

The standard does not have an exemption for manual dry standpipes.



Question #7 – Water Tank Refill

The water supply on a project consists of a 1,000 gpm pump taking water from an on-site water storage tank.

What is the required refill rate for a tank in accordance with the 2018 edition of NFPA 22?

The required refill rate in accordance with NFPA 22 is 8 hours. This is referenced in sections 14.4.2 and 4.2.1.4 of the 2018 edition of NFPA 22.

Section 14.4.2 states that the means to fill the tank must be in accordance with section 4.2.1.4 which states that the water supply must be *“capable of filling the minimum required fire protection volume within the tank in a maximum of 8 hours.”*

Section 14.4 which is titled “Filling” includes all the requirements for filling of tank.

It must also be noted that the refill rate could also be used for more than the basic refilling of the storage tank, it can also be used to help reduce the overall required tank capacity.

For example, Section 4.1.6 states that the tank must be sized so that the stored capacity plus the *“reliable automatic refill”* meets the system demand for the required design duration.

Additionally, the concept of break tanks rely on specific refill rates to meet water supply capacity requirements. Refer to Section 14.5 for details of this concept.

Question #8 – Sprinkler Testing

A project required that the sprinklers be tested (or replaced) in accordance with NFPA 25. The project is a five-story building with approximately 1,700 sprinklers.

A sprinkler on the first floor failed. Does this mean all the sprinklers in the building need to be replaced or just the sprinklers on the first floor?

It depends on what was submitted as the sample area. If 1% of the 1,700 sprinklers was submitted for testing as one sample, then yes, all sprinklers will require replacement. If you submitted 1%, or a minimum of 4 for different sample areas, only the samples area where the failure is would require replacement. Below is an example used in a NFSA magazine article from 2019.

Example:

Based on section 5.3.1.2, the sample area or groups of sprinklers can be determined by the inspector and/or the building owner. Keep in mind that sprinklers should be chosen from different floors and areas of the building and not because they are easier to access than other sprinklers.

In this example a five-story apartment building with 100 sprinklers per floor was used.

If the sample area were chosen by floor, it would be required to take a minimum of 4 sprinklers from each floor which would be 20 sprinklers. If the entire building was the sample area, it is required to take 1%, or 5 sprinklers, as the sample. Note the difference in sending out 5 sprinklers vs. 20 sprinklers for testing.

Section 5.3.1.3 states that where one sprinkler within a representative sample fails to meet the test requirement, then all sprinklers within the sample area represented by that sample must be replaced.

This means that if one sprinkler fails, all sprinklers in that sample area must be replaced. In the example above, if the by floor sample was used and one sprinkler failed on a floor, only the 100 sprinklers on that floor would require replacement. If the entire building sample was chosen and one sprinkler failed, then all 500 sprinklers in the building would require replacement.

This information should be discussed between the contractor and the building owner to discuss benefits and drawbacks of different sampling areas and sizes.



OL Advance
Series

**FIRE PROTECTION AIR COMPRESSORS
WITH UL LISTED DIGITAL PRESSURE SWITCH
& AUTOMATIC DRAIN VALVE ON TANK MOUNTED UNITS**

Question #9 – Dry Fire Sprinkler System Inspectors Test & Auxiliary Drains / Building Seismic Joint

Are there any special requirements in the 2016 edition of NFPA 13 for seismic bracing of an inspector's test where it crosses a building seismic joint, for a dry fire sprinkler system in a below grade parking garage?

No, aside from flexible couplings in Section 9.3.2.3.1(6), an inspector's test piping arrangement does not meet the definition of a branch line, cross main, or feed main, so it is exempt from seismic bracing and restraint. It would be considered "sprinkler piping" per Section 9.3.3.1 for the seismic separation assembly; however, piping below grade in a parking garage does not need to have a seismic separation assembly per the same section.

Question #10 – Draining Multiple Adjacent Trapped Branch Lines

Is a drum drip needed where tie-in drains are provided for multiple adjacent trapped branch lines per NFPA 13, 2013 edition, Section 8.16.2.5.3.6, and the capacity of trapped section is more than 5 gal?

Yes. As the branch lines in question include a capacity of more than 5 gallons of trapped piping, the requirements for a “drum-drip” or condensate nipple as highlighted in section 8.16.2.5.3.5 would apply. There is no language in section 8.16.2.5.3.6 (tie in drains for multiple adjacent trapped branch lines) which would override the requirement for a “drum drip.”

It should be noted that the handbook commentary for section 8.16.2.5.3.6 discourages the use of tie-in drains for multiple branch lines as this would create a gridded drain system which could delay the water discharge times.

Question #11 – Group A Plastics with Fire Retardant

If a Group A plastic commodity is treated with a fire retardant, is it still considered by NFPA 13 to be a Group A plastic?

Adding a fire retardant to a Group A plastic usually does not modify the commodity classification but it depends on the amount and determination by the design professional.

This is discussed in Section A.20.4.5 of the 2019 edition of NFPA 13, where it states that the addition of a fire retardant should not be the “...sole basis for a reduction in classification.” This annex note goes on to say that “...full-scale or commodity classification type testing would be necessary to justify any such reduction in classification.”

As noted above, the design professional would need to make this determination. The whole unit load, including packaging, needs to be considered, as required by Sections 20.4.5.3 or 20.4.5.4.

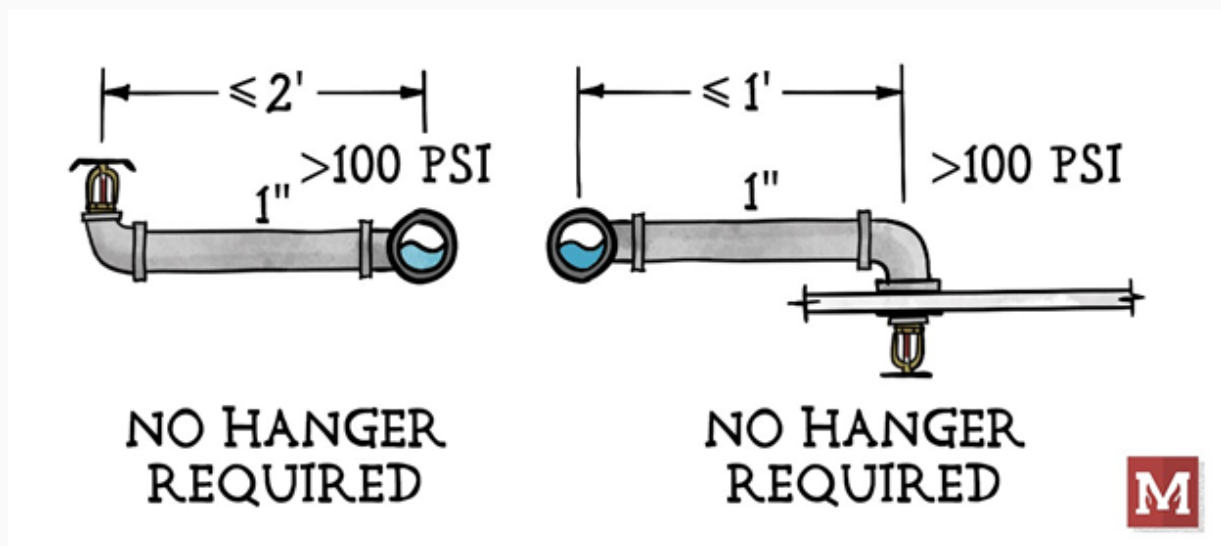
Question #12 – Hanger Requirement for Exposed Armover with Upright Sprinklers Over 100 PSI

Can upright sprinklers on 1" be installed on an unsupported armover up to 2 feet where the system pressure exceeds 100 psi?

Yes, you can install an upright sprinkler on an unsupported armover with a cumulative length not exceeding 2 feet even when the system pressure exceeds 100 psi.

NFPA 13, 2016 edition, Section 9.2.3.5 is specific to unsupported armovers and requires the cumulative horizontal length of an unsupported armover to a sprinkler, sprinkler drop, or sprig not exceed 24 inches for steel pipe. This section is applicable to all armovers including those for upright sprinklers. If you have an armover supplying an upright sprinkler with a cumulative horizontal length of 24 inches or less for steel pipe, it is not required by the standard to be equipped with a hanger.

Section 9.2.3.5.2 addresses the unsupported armover length with maximum pressure exceeding 100 psi with the branch line located above the ceiling supplying sprinklers in the pendent position below the ceiling. This section requires where the maximum static or flowing pressure, whichever is greater at the sprinkler, applied other than through the fire department connection, exceeds 100 psi and a branch line above a ceiling supplies sprinklers in a pendent position below the ceiling, the cumulative horizontal length of an unsupported armover to a sprinkler or sprinkler drop shall not exceed 12 inches for steel pipe. This section is applicable to only armovers supplying pendent sprinklers below the ceiling when the pressure exceeds 100 psi, reduces the unsupported cumulative length to 12 inches for steel pipe, and would not be applicable to your case when using upright sprinklers.



Learning and Development



Orlando, Florida

Layout Technician: Application – A 3-day in-person instructor-led class that applies the fundamental content learned in the previous course. Using project-based learning, students apply their knowledge of fire sprinkler layout concepts to a legitimate plan, learning through problem solving, research, and simply doing.

You will receive access to Layout Technician: Fundamentals in your My eLearning dashboard within 72 hours of registration for Layout Technician: Application. **You must complete Layout Technician: Fundamentals before you attend Layout Technician: Application.**

The content for Layout Technician: Fundamentals will be released to participants following registration.

Registration closes November 8, 2022.

Start Date: Dec 6, 2022 08:00 AM (ET)

End Date: Dec 8, 2022 05:00 PM (ET)

Exact Location TBD

[Register Here](#)

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)



[Contact Us](#)



National Fire Sprinkler Association
514 Progress Drive, Linthicum Heights, MD 21090
1-800-683-NFSA (6372)

[Unsubscribe](#)