

## TechNotes Issue # 434

February 25, 2020

This edition of TechNotes provides a summary of first draft revision changes to the 2022 edition of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, relative to sprinkler and standpipe system requirements. Some of these changes, if incorporated, will create new challenges for our industry. This TechNotes has been prepared by Michael Joanis, P.E.

As I am new to the NFSA staff, a quick introduction is required. I am Michael Joanis, P.E. and I serve NFSA as Director of Contractor Services. As part of the leadership team, I am responsible for assessing the needs of our contractor members and assisting our Engineering, Code & Standards, and Training departments with the delivery of technical and member services. I am a graduate of the University of Maryland and have a B.S. degree in fire protection engineering. I am a licensed fire protection professional engineer, licensed sprinkler contractor, and former firefighter. I have 28 years of experience as a fire sprinkler contractor and consulting engineer. I am excited to be part of the NFSA team and look forward to working with you to support the NFSA mission.

### Upcoming Technical Tuesdays

March 17, 2020

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### EOD Submissions

Via Email : [eod@nfsa.org](mailto:eod@nfsa.org)

Via Phone : (443) 863-4464

To improve your response time, please include in the email subject line the following information: code/standard and edition year (example: NFPA 13 2016, 2018 IBC, 2017 NFPA 25, etc.).

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The last several years have seen a large demand for multifamily residential housing. These buildings are often maxed out for Type V construction height and area allowances, constructed on top of parking garages (commonly referred to as podium or pedestal buildings) or retail buildings, comprised of multiple residential Type V buildings connected with fire walls, have limited fire department vehicle access, and are located in urban settings with exposure risks. Many fire protection features are not present or are being installed during construction and the combustible load is high. Most notably, the fire sprinkler systems are not active during construction since they have not been accepted or commissioned. From the time these buildings are framed until the fire protection systems go in service, they are vulnerable to uncontrolled fire growth. Although fire extinguishers and a temporary standpipe are required during construction, they may not be sufficient, as has been proven by these fires observed in the national news. The number of large loss fires on construction sites has increased significantly. This has created a major challenge to fire service resources and safety.



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Virginia firefighters battled a large fire at a multistory construction site in Fairfax County, Virginia. (Courtesy Anthony Kelleher)

It is important to first refer to the applicable building and fire codes to determine the proper edition of NFPA 241 to reference for requirements. The scope of NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, includes structures in the course of construction, alterations, or demolition, including those in underground locations. The purpose is to prescribe minimum safeguards for construction, alteration, and demolition operations in order to provide a reasonable degree of safety to life and property from fire during such operations.

We are going to focus on new sprinkler and standpipe system requirements for structures during construction. The first draft report is currently available for NFPA 241-2022 and the document is open for public comment on the NFPA website ([www.nfpa.org/241](http://www.nfpa.org/241)) until May 6, 2020. The first draft report includes additional requirements for sprinkler and standpipe systems during construction. These changes are located in Chapter 4 of the document which has been retitled "General Requirements," whereas previous editions used the title "Fire Protection."

NFPA 241 section 4.3 has also been retitled from "Fire Protection During Construction" to "Fire Protection." Section 4.3.2 provides requirements specific to sprinkler systems and two important requirements will be imposed by First Revision #49 if these changes remain in the 2022 edition of the standard:

1. FR #49: Section 4.3.2.2 indicates that the use of temporary measures required to place fire protection systems in service during construction shall be considered practicable and shall be evaluated based on the hazard and scope of the temporary measures. The appendix indicates examples of practical temporary measures.

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2. FR #49: Section 4.3.2.3 indicates that fire protection systems placed in service during construction shall comply with the applicable NFPA standards to the greatest extent practical.

Several Public Inputs (PIs) had been submitted regarding these requirements for sprinkler systems during construction. Most importantly, it was identified that the term "practicable" is nebulous. If left in the standard it should be relocated to the annex since it is subjective and unenforceable language. Use of the term "practical" would also be subjective.

Four additional FRs were made which impact requirements for sprinkler and standpipe systems during construction.

1. FR #48: Section 4.3.8 requires signage on fire protection system control valves during construction to indicate if they can be used to place systems in service during an emergency. This could be a dangerous requirement because the sign(s) would also need to identify all steps necessary to ensure that the system is operable. This might include opening additional valves, turning on power to pumps, or something else beyond simply opening the valve.

2. FR#58: Section 4.6 provides requirements for standpipes which includes two notable changes impacting standpipe systems. Section 4.6.3 requires not less than one half of the required standpipes be provided during construction. Note that section 4.10.4.1 now requires not less than one half of the exit stairs be provided during construction as well. Section 4.6.3.2 requires standpipe systems during construction to be pressure tested.

3. FR #42: Chapter 12: Tall Timber High Rise Wood Structures

Section 12.6.2 requires each egress stair required by section 4.6 during construction to be equipped with a standpipe. Because section 4.6 requires no less than one half of the egress stairs, this is an additional requirement to the current standard that only requires one standpipe during construction. It also specifically requires the standpipe in the egress stair.

Section 12.6.3 for tall timber high rise structures requires the fire department connection be within 100 feet of a fire hydrant.

Section 12.7 requires fire protection systems to be



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placed in service during construction. There is currently no further guidance on when or how fire protection systems are placed in service during construction nor does this section address compliance with NFPA 13 for these systems.

#### 4. FR #45: Chapter 13: Large Wood Structures [New Chapter]

Section 13.1.2 defines large wood structures as all wood structures up to three stories in height and greater than 150,000 sf aggregate total floor area or wood structures over three stories or 40 feet above the lowest level of fire department vehicle access and greater than 50,000 sf aggregate total floor area. I expect this definition will receive much attention during public comment and second draft and may be expanded to address the presence of exposure buildings.

Section 13.5.2 requires each egress stair required by section 4.6 during construction to be equipped with a standpipe. Because section 4.6 requires no less than one half of the egress stairs, this is an additional requirement to the current standard that only requires one standpipe during construction. It also specifically requires the standpipe in the egress stair.

Section 13.5.3 requires the fire department connection to be within 100 feet of a fire hydrant.

Section 13.6 requires fire protection systems be temporarily placed in service during construction. There is currently no further guidance on when or how fire protection systems are temporarily placed in service during construction nor does this section address compliance with NFPA 13 for temporary systems.

Please take the time to determine NFPA 241 requirements for your projects. The standard requires all parties involved in the construction process participate in the fire prevention program. The first draft report is a step towards requiring construction of large wood structures to include half of the egress stairs, half of the standpipe risers, and temporary sprinkler protection during construction.

NFSA maintains an active role in the development of codes and standards including NFPA 241. Please feel free to contact me with any questions or comments at [joanis@nfsa.org](mailto:joanis@nfsa.org).

#### Editor's Comments

The idea of installing temporary sprinkler systems

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during construction is well intended but adding requirements for having these systems without having specific detailed requirements for installation has been the cause for significant debate and has become heightened over the past few years as a result of large fire losses in building under construction. NFSA contractors have reported jurisdictional requirements to maintain compliance with all provisions of NFPA 13 throughout construction or renovation of a building. In my opinion, this is overkill since it escalates the cost of system installations to the point where it becomes prohibitive. There are other issues beyond cost which are more important.

The extent of the requirements will also need to identify suitable water supplies, needs for supervision and alarms, who takes ownership of the systems and when, how inadvertent discharge events be handled during a working construction site, and so on.

NFPA 241-2022 now defines the role of a Fire Prevention Program Manager in section 4.1. This person would be appointed by the owner and would need to be approved by the authority having jurisdiction (AHJ). It could be assumed that the Fire Prevention Program Manager would be left making decisions regarding whether it is, or it is not "practicable" or "practical" to install a temporary sprinkler system. The qualifications of this Fire Prevention Program Manager would be extremely important. In my opinion, there are likely very few individuals that would really be qualified to make decisions about installation requirements, defining the extent of NFPA 13 compliance needs, timing decisions, and ownership of the systems. All of these have a huge impact on liability.

Requirements for compliance with NFPA 241 should be identified in the contract specifications or identified by the owner during the bidding process. Identification of temporary fire protection requirements should not be left up to the contractor.

### **Editorial Corrections to TechNotes #433**

Two questions included in TechNotes #433 require clarifications. We received several comments are glad to see that people are paying such close attention to these "Best Of" issues. Thanks to all for the continued support and feedback.

Question #4 identified ESFR Sprinkler Obstructions but should have identified Extended Coverage Sprinklers. Thanks to Kevin Olson of Western States Fire Protection Co. and Aleksander Hoffman of Viking Fire Protection, Inc. for their comments on this question. You both passed the test. The corrected question is included below.

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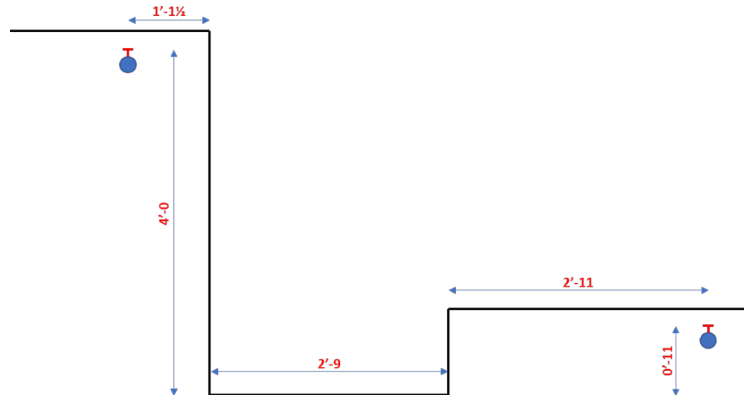
**Standpipe Systems for Fire Protection**  
March 16, 2020  
Millburn, NJ

**Standpipe Systems for Fire Protection**  
March 17, 2020  
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#### Question #4 - Extended Coverage Sprinkler Obstructions

Per the sketch below, can a project utilizing extended coverage sprinklers omit the sprinkler below the 2 ft. 9 in. soffit if sprinklers are located on either side of the obstruction per NFPA 13-2016 sections 8.8.5.1.2(2) and 8.8.5.2.1.4?



**Answer:** The answer to your question is "yes." Sprinklers may be omitted below the lower soffit if sprinklers are located on either side of this obstruction per NFPA 13-2016 sections 8.8.5.1.2(2) and 8.8.5.2.1.4, and the spacing between the two sprinklers does not exceed the maximum allowable distance per NFPA 13-2016. The fact that the distance from the sprinkler deflector on one side exceeds 18 inches does not change this allowance. The sections referenced in Chapter 8 do not contain any language limiting the distance from the bottom of the soffit to the sprinkler deflector at the upper ceiling.

In further support of this concept, refer to Figure 8.8.5.1.2(c) which is, in essence, half of the situation described. Figure 8.8.5.1.2(c) does not have an 18-inch limitation from the bottom of the soffit to the sprinkler deflector at the upper ceiling, and this concept should apply to this situation.

Question #12 regarding flushing was incomplete. Thanks to Terry Victor of JCI regarding his feedback on Question #12. The required flush rate for piping feeding a fire pump is based on 15 ft/sec in accordance with NFPA 20 and not 10 ft/sec as required by NFPA 13 or NFPA 24. An 8 in. underground line should be flushed flowing 2,350 gpm in accordance with NFPA 20-2019 Table 14.1.1.1.

Also, NFPA 25 does make reference to "Flush in conformance with NFPA 24 or NFPA 20, as appropriate" in Table 7.5.1. The higher flush rate is required so stones don't enter the pump impeller, which was the condition that caused the need for the flush in

the first place in the EOD question.

An 8 in. suction pipe can feed up to a 1,500 gpm pump, which is capable of flowing 2,250 gpm at 150% of rated flow, so the higher flush rate slightly exceeds that.

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