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TechNotes

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Changes in the 2019 Edition of NFPA 13R and NFPA 13D

The 2019 editions of NFPA 13R and NFPA 13D have recently been published by the NFPA. These editions contain a number of new requirements that are important to everyone in the fire sprinkler industry. This TechNotes will focus on the changes to these two important installation Standards. It has been prepared by Roland Asp, NFSA's Manager of Installation Standards. This summary will explain the changes that are most important in the opinion of the author. This will not be a list of every change to the standard but is intended to help everyone understand the major items with respect to the installation requirements for residential sprinkler systems in accordance with NFPA 13R and NFPA 13D.

NFPA 13R

Carport Definition (3.3.2). *A new definition for carports has been added. A carport is now defined as a freestanding or attached covered structure open on at least two sides that provides shelter for motor vehicles.*

Pipe or Tube Listed for Light-Hazard in Ordinary-Hazard Rooms (5.2.2.2 and 5.2.2.2.1). As in the 2016 and earlier editions of NFPA 13R, section 5.2.2.2 allows pipe and tube that is listed for light-hazard occupancies to be installed in ordinary-hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 sq. ft. A new section was added (5.2.2.2.1) that clarifies that this piping may be exposed if allowed by the listing.

Pipe or Tube Listed for Light-Hazard above Ordinary-Hazard Rooms (5.2.2.3). A new section was added outlining the conditions where pipe listed for light hazard is permitted to be installed above ordinary hazard rooms. These conditions are:

- In rooms 400 sq. ft. or less: Pipe may be exposed in accordance with listing or concealed behind 3/8-inch-thick gypsum wall board or ½-inch thick plywood.
- In rooms over 400 sq. ft.: Pipe must be concealed behind 3/8-inch-thick gypsum wall board or ½-inch thick plywood.

Areas Subject to Freezing (5.4.4). The 2016 edition stated that water filled pipe is permitted to be installed in areas where

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the temperature is less than 40° Fahrenheit when heat loss calculations are performed. In the 2019 edition, the wording of this section that stated *where the temperature is less than 40° Fahrenheit was changed to where subject to freezing*. The reasoning is stated in a new annex section A.5.4.4 which reads: There are some geographic regions where the temperature will get below 40°F (4°C) for brief periods of time. However, the water in the pipe has sufficient thermal mass to keep it from freezing and thus additional freeze protection is not required. Heat loss calculations are still required.

Standard Response Sprinklers in Garages (6.2.2.3). A new allowance was added to permit the use of standard response sprinklers to be used in garages that are not considered part of the dwelling unit (accessible by more than one dwelling unit). Previous editions required the use of quick response or residential sprinklers. In garages it is often difficult to route water filled pipe to meet the limitations of quick response dry sidewall sprinklers and often dry systems would be required. The use of standard response sidewall sprinklers would give the user an acceptable option to dry systems.

Fireplace Diagrams (A.6.2.3.3.3). New Annex figures were added to clarify the requirements for locating ordinary temperature and intermediate temperature rated sprinklers adjacent to fireplaces. Similar diagrams were added to both NFPA 13 and NFPA 13D.

Temperature Ratings of Sprinklers near "Cool Air" Diffusers (6.2.3.3.3.1). A new section was added stating that sprinklers adjacent to diffusers that do not discharge air exceeding 100° Fahrenheit do not need to meet section 6.2.3.3.3 regarding minimum distances from heat sources. It should be noted that similar provisions are already in NFPA 13.

Temperature Ratings of Sprinklers in closets with "Ventless" Clothes Dryers (6.2.3.3.4). Ventless clothes dryers are a relatively new concept and they have the ability to raise ceiling temperatures above 100° Fahrenheit. This new section requires sprinklers in closets with ventless clothes dryers to be of the intermediate temperature rating or higher. A similar change was made in NFPA 13D.

Residential Pendent Sprinkler Location Under or Adjacent to Beams (6.4.6.1.1.1). Guidance and figures were added to locate residential pendent sprinklers under or adjacent to beams. This guidance is limited to residential pendent, recessed pendent and flush-type pendent sprinklers. Beam depth is limited to 14 inches. For sprinklers installed directly under the beam, the deflector must be 1 to 2 inches below the beam or per manufacturer's instructions. For sprinklers installed adjacent to the beam, the sprinkler is permitted to be up to 2 inches from the outside edge of the beam and the deflector must be 1 to 2 inches below the beam or per manufacturer's instructions. Similar sections were added to both NFPA 13 and NFPA 13D.

Residential Concealed Sprinklers Under Beams (6.4.6.1.2). Residential concealed sprinklers are permitted to be installed in beams no more than 4 inches in depth. A similar

section was added to both NFPA 13 and NFPA 13D.

Allowable Obstruction Zone of Pendent Sprinklers in Hallways (6.4.6.3.4.5). This new section states that in hallways up to 6-foot in width, pendent sprinklers are permitted to be located adjacent to obstructions as shown in figure A.6.4.6.3.4.5. This figure shows an allowable obstruction zone the width of the obstruction across the 6-foot or less hallway.

Allowable Obstruction Zone of Sidewall Sprinklers in Hallways (6.4.6.3.5.5). This new section is the same allowance as for pendent sprinklers. The allowable obstruction zone is shown in figure 6.4.6.3.5.5.

Waste and Linen Handling Systems (6.5.4). A new section was added to provide requirements for sprinkler protection in waste and laundry chutes.

Exterior features where sprinklers are not required (6.6.5). Section 6.6.5, which highlights exterior areas where sprinklers are not required was reformatted in a list form with the following changes: Lanais were added as the committee felt that these outdoor spaces were similar to patios. Similar features were added to the list so that this section does not need to specifically call out all exterior spaces that do not require sprinkler protection. Wording for open corridors was revised to align with the IBC requirements. Section 6.6.5 now reads sprinklers are not required in "Corridors that are open to the outside atmosphere and are separated from the exit stairwell". To further correlate with these building code requirements, the annex figures showing examples of open corridors was removed from NFPA 13R.

Fuel-Fired Equipment (6.6.6.3 and 6.6.6.4). Requirements from NFPA 13D were brought into NFPA 13R. The requirements in the 2019 edition of NFPA 13R state that where fuel-fired equipment is located above all occupied areas, no sprinkler protection is required in the concealed space. Where the fuel-fired equipment is located below or on the same level as occupied areas, at least one quick response intermediate-temperature sprinkler shall be installed above the fuel fired equipment or at the wall separating occupied space.

Floor Control Valves (6.8.8). A new section was added clarifying that floor control valves are not required in multi-story buildings in accordance with NFPA 13R

Garages Serving a Single Dwelling Unit (7.3.3). The 2016 and earlier editions already state that garages accessible from a single dwelling unit are considered part of the dwelling unit. This new section states that garages that serve only a single dwelling unit are also considered part of the dwelling unit. This section would apply to garages that serve a single dwelling unit but are accessed from a shared hallway and states that these garages are also part of the dwelling unit.

Occupied Attics vs Attic used for Storage (7.4.1). Section 6.6.6 requires sprinklers in attics that are intended for living purposes or storage. This new section gives guidelines on what sprinkler criteria is to be utilized. Where the attic

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(occupied or used for storage) is considered part of the dwelling unit, the criteria of 7.1 (Inside Dwelling Units) shall be met. Where the attic (occupied or used for storage) is considered outside the dwelling unit, the criteria of section 7.2 (Outside Dwelling Unit) shall be met.

Other Attics (7.4.3). NFPA 13R does not require sprinklers in attics that are not intended for occupancy or storage. However, there may be times when the building code would require sprinklers in these spaces. This new section states that such attics may be protected in accordance with NFPA 13 or by specially listed sprinklers.

Water Supplies (Chapter 9). Chapter 9 has been substantially expanded to better correlate with NFPA 13. New domestic demand requirements were added, and updated fixture load values have been moved from the annex into the body of NFPA 13R.

NFPA 13D

Bathroom Definition (3.3.1). Earlier editions of NFPA 13D did not contain a definition of a bathroom. This has caused confusion especially when a bathroom was divided into separate rooms and the combined total size exceeds 55 sq. ft. To clarify this issue, the bathroom definition found in NFPA 13R was added to NFPA 13D.

Water Supply Pipe and Fittings (5.3). There are times when the water supply source and the riser assembly is not within the dwelling unit. This scenario is used by FEMA manufactured housing units and may also happen in retrofit applications. This new section states that the piping and fittings between the point connection and the water supply source and the piping and fittings between a remote riser and the dwelling must be acceptable by the applicable plumbing code.

Stored Water Quantity (6.1.3). Previous editions of NFPA 13D calculated the minimum stored water quantity based upon the demand of two sprinklers times the required duration. There are times where a compartment with a single sprinkler (at a greater spacing) may have a greater demand than that calculated for two sprinklers at a lesser spacing in a compartment. Section 6.1.3 was changed to calculate the minimum water quantity based on the highest calculated water demand.

Refill Rate for Stored Water (6.1.5).Previously, NFPA 13D allowed the refill rate to be used in determining the minimum quantity of water when a well was used. This new section specifically allows the refill rate to be used with storage tanks with an automatic refill regardless of the water source.

Annex Diagram for Town House Stand-Alone Piping System (A.6.2(e)).An annex figure was added illustrating that it is acceptable to feed a stand-alone sprinkler system for a townhouse with a single water supply connection. Each town house will have a separate control valve but may be supplied by a single feed main run either at the exterior or the interior of

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the townhouse building.

Drains for Multipurpose Systems (A.7.2.1). Section 7.2.1 states that each sprinkler system must have a minimum ½" drain on the system side of the control valve. A new annex note was added to suggest that for multipurpose systems, a plumbing fixture on system side can meet this requirement. Hangers Exposed to Sprinkler Protected Areas (7.4.5). This new section states that where sprinkler piping is exposed to the sprinkler protected area, then the pipe must be supported by metal hangers or hangers made of the same material as the structure. The purpose of hangers made of the same material as the structure is to allow the pipe to be hung from a wood trapeze hanger from the wooden structure. An annex note was added (A.7.4.5) to clarify this.

Fireplace Diagrams (A.7.5.6.3(3)). New Annex figures were added to clarify the requirements for locating ordinary temperature and intermediate temperature rated sprinklers adjacent to fireplaces. Similar diagrams were added to both NFPA 13 and NFPA 13R.

Temperature Ratings of Sprinklers in Closets with "Ventless" Clothes Dryers (7.5.6.3(5)). Ventless clothes dryers are a relatively new concept and they have the ability to raise ceiling temperatures above 100° Fahrenheit. This new section requires sprinklers in closets with ventless clothes dryers to be of the intermediate temperature rating or higher. A similar change was made in NFPA 13R.

Baffle Equivalent (8.13.1.3). This new section states that where there is a physical barrier that prevents each sprinkler from directly spraying on the other, there shall be no minimum distance between sprinklers. The physical barrier in effect acts like a baffle.

Residential Pendent Sprinkler Location Under or Adjacent to Beams (8.2.1.2). Guidance and figures were added chapter 8 to locate residential pendent sprinklers under or adjacent to beams. This guidance is limited to residential pendent, recessed pendent and flush-type pendent sprinklers. Beam depth is limited to 14 inches. For sprinklers installed directly under the beam, the deflector must be 1 to 2 inches below the beam or per manufacturer's instructions. For sprinklers installed adjacent to the beam, the sprinkler is permitted to be up to 2 inches from the outside edge of the beam and the deflector must be 1 to 2 inches below the beam or per manufacturer's instructions. Similar sections were added to both NFPA 13 and NFPA 13R.

Residential Concealed Sprinklers Under Beams (8.2.1.3). Residential concealed sprinklers are permitted to be installed in beams no more than 4 inches in depth. A similar section was added to both NFPA 13 and NFPA 13R.

Shadow Area in Corridors (8.2.5.6). The allowance from NFPA 13R to allow shadow areas up to 2 ft in depth behind sidewall sprinklers in corridors was extracted into NFPA 13D.

Chimney or Flue Passing through a Concealed Space

(A.8.3.5.1.2). When fuel fire equipment is located below or on the same level as the dwelling unit,Section 8.3.5.1.2 requires a quick response sprinkler to be installed above fuel fired equipment or at the wall separating the fuel fired equipment from the occupied space. Some were interpreting this to apply to the chimney passing through an attic space and requiring a sprinkler to be installed in the attic. This is not the intent of this section and an annex note was added to clarify. This annex section reads: "*Where a chimney or flue from fuel-fired equipment passes through a concealed space, it is not required to locate a sprinkler in this concealed space*."

Unheated Enclosures at Building Entrance (8.3.6). NFPA 13D does not require sprinklers in the unheated entrance enclosures (mud room) as long as there is another way out of the dwelling. Previous editions of NFPA 13D used the term egress which has specific requirements in the residential codes. The term egress was changed to entrance/exit to clarify that a code compliant egress is not required but simply another way out of the structure.

Areas Subject to Freezing (9.1.1 and 9.1.2). Section 9.1.1 of the 2016 edition stated: *A wet wipe system shall be used where all piping is installed in areas not subject to freezing... In the 2019 edition the wording of this section was changed to read: A wet wipe system shall be used where all piping is installed in areas not subject to freezing.... The reasoning is that there are some geographic regions where the temperature will get below 40°F (4°C) for brief periods of time. However, the water in the pipe has sufficient thermal mass to keep it from freezing and thus additional freeze protection is not required.*

Inactive Systems (12.3.6.1). A new section was added that clarifies that it is acceptable to turn off the sprinkler system to a dwelling when there will not be occupants for an extended period. Four examples are provided:

- After a manufactured home has been installed and tested in the factory and is being prepared for shipment
- When a manufactured home is being stored for future occupancy
- When the detached dwelling is unoccupied during renovation work, with notification and approval of the AHJ
- When the detached dwelling is unoccupied for an extended period of time, with notification and approval of the AHJ

Procedures for draining and inspection prior to occupancy has also been added.