

*Editor-Kenneth E. Isman, P.E.*  
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## Changes in the 2013 Edition of NFPA 13 Installation Criteria and Hanging and Bracing

The 2013 edition of NFPA 13 was published by the NFPA in October of 2012. This new edition of the standard contains a number of new requirements that are important to everyone in the fire sprinkler industry. The list is extremely long, so it will be broken up into two editions of e-TechNotes. This issue will focus on the changes to the installation criteria and hanging and bracing rules of NFPA 13. This summary will explain the changes that are most important in the opinion of the editor. This will not be a list of every change to the standard, but is intended to help everyone understand the big issues with respect to installation, hanging and bracing. The following items were changed:

**Sprinkler System Definition (3.3.22).** The definition was changed as follows: “Sprinkler System. An integrated network of piping designed in accordance with fire protection engineering standards that includes a water supply source, a water control valve, a waterflow alarm, and a drain and is commonly activated by heat from a fire, discharging water over the fire area. The portion of the sprinkler system above ground is a network of specifically sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern. The system is commonly activated by heat from a fire and discharges water over the fire area.”

This new definition implies that every combination of a water control valve, flow alarm, and drain constitutes a unique sprinkler system. This answers the age-old question regarding a floor control assembly and whether it makes for separate systems on each floor or not. The answer under this new definition is “yes.” A multiple story building with separate floor control assemblies that include control valves, alarms, and drains will be considered a bunch of separate sprinkler systems instead of one system. This will have significant implications on the inspection, testing and maintenance requirements. See the changes to sections 8.16.1.5 for a related change on floor control assemblies.

**Reusing Sprinklers (6.2.1.1).** Once a sprinkler has been removed, it cannot be reinstalled. A new sprinkler must be installed in its place. Note that this technically does not apply to sprinklers on drops. When a whole drop is removed, with the sprinkler on the end undisturbed, the drop can be reinstalled as long as the sprinkler is taken care of while it is out of the system so that it is not damaged or subjected to heat beyond its temperature range.

**Ceiling Penetrations for Recessed and Concealed Sprinklers (6.2.7.4).** Clarification that caulk or glue is not permitted to be used to seal the penetration caused by a recessed or concealed sprinkler or to affix the cover plate to a concealed sprinkler. This has been a longstanding prohibition in the listings of the sprinklers, but some code enforcement authorities needed it spelled out for them in the standard directly.

**Underground Pipe Transition to Aboveground (6.3.1.1.1).** Underground pipe is permitted to extend 24 inches beyond the slab or wall where it comes into the building. This is to provide a reasonable way to make the transition to the aboveground pipe. While this has always been a reasonable practice in the industry, some AHJ’s have been giving contractors a hard time about a pipe material only permitted for underground service from showing above the floor or beyond a basement wall. The change clarifies that a short part of this exposed underground pipe is acceptable.

**CPVC Pipe (6.3.1.1 and 6.3.7).** CPVC pipe is moving from being a “special” product to a generic product. It is still required to be listed, and installed in accordance with its listing, but some of the rules will be moved from the manufacturer’s instructions to NFPA 13.



**Nonmetallic Pipe and Compatibility (6.3.7.2, 6.2.7.4 and 6.3.7.5).** Three specific compatibility issues with listed nonmetallic pipe will need to be addressed by the listing laboratory or some other laboratory acceptable to the AHJ:

- Where nonmetallic pipe is installed in a combination system with steel pipe internally coated with corrosion inhibitors, the steel pipe coating needs to be investigated by a laboratory for compatibility with the nonmetallic pipe.
- Where nonmetallic pipe is installed in a combination system with steel pipe, cutting oils and lubricants used for fabricating the steel piping must be compatible with the nonmetallic piping.
- Firestopping materials intended for use on nonmetallic piping penetrations need to be investigated for compatibility with the nonmetallic pipe material.

**Nitrogen in Dry Systems (7.2.6.8).** A number of changes were made throughout the standard to clarify the rules when nitrogen is used as the gas in dry pipe systems rather than air. Note that no advantage is given to nitrogen systems. This series of changes just clarifies a long-standing situation where nitrogen has always been permitted as the gas in the system.

**Antifreeze (7.6.2).** The antifreeze rules have completely been rewritten using the latest in test data from the Fire Protection Research Foundation. For all new systems, only listed antifreeze solutions are permitted to be used except for ESFR sprinklers that have been listed with an antifreeze solution. At this point in time, there are no listed antifreeze solutions, so this change effectively eliminates the design or installation of new antifreeze systems until a listed solution becomes available.

**Shadow Areas (8.1.1(3)).** An annex note was added to the standard to say that it is not the intent of the standard to get direct water spray into every bit of floor space in a building. This is the best that the committee could do in trying to develop specific shadow area rules that would not be exploited or misused. It has never been the intent of NFPA 13 to say that water has to directly spray into each square foot of floor space in a room.

**Sprinklers in Equipment (8.1.1(8)).** A clarification that sprinklers are not required in electrical equipment, mechanical equipment or air handling units as long as the equipment or units are not intended for occupancy.

**Extended Coverage Sprinklers and Obstructed Construction (8.4.3(6)).** A clarification that extended coverage sprinklers can be installed with obstructed construction as long as the structural members are solid and each bay has its own sprinkler(s). In this manner, each bay really becomes its own unobstructed ceiling space as far as the sprinkler is concerned. The construction needs to be solid to prevent water spraying from one sprinkler to another since they will typically be within 6 ft of each other horizontally.

**Residential Sprinklers in a Compartment (8.4.5.3).** For years there has been a bit of a contradiction in NFPA 13 regarding the mixing of quick response and residential sprinklers in a compartment. Section 8.3.3.2 explicitly stated that mixing of quick response and residential sprinklers was prohibited while section 8.4.5 implied that it was okay. The standard was interpreted as prohibiting the practice because an explicit prohibition overrules an implied permitted practice. But the implication of permitting the practice has been removed and 8.4.5 has been modified to be clear that if residential sprinklers are going to be used in a compartment, then all of the sprinklers in the compartment must be residential.

**Minimum Barrel Lengths for Dry-Type Sprinklers (8.4.9.1).** Dry-type sprinklers (dry pendent, dry upright, and dry horizontal sidewall sprinklers) have always needed a minimum barrel length when connected to wet piping to prevent the piping from freezing due to cold temperatures being conducted back to the branch line. The minimum barrel length is dependent on the expected cold temperature outside and the warm temperature to which the barrel will be maintained. The problem is that these minimum lengths were in the manufacturer's literature and each manufacturer used slightly different numbers because they made slightly different assumptions in calculating the minimum length that was needed. The information has been moved to NFPA 13 and standardized (with all of the manufacturers agreeing to the standardized lengths) to simplify the requirement and to make sure that everyone, including architects, knows the correct lengths.

**Closets (8.5.5.4).** For all closets up to 400 cubic feet in volume (including mechanical closets), a single sprinkler at the top of the closet can be installed without regard to obstructions or minimum distances to a wall

**Baffles Between Standard Spray Sprinklers (8.6.3.4.2).** Where standard spray sprinklers are spaced closer than 6 ft, the standard has always permitted the situation as long as there are baffles between the sprinklers. In the 2013 edition, the baffle rules have been changed so that they no longer have to be noncombustible. The baffles now only need to be solid and rigid materials that will stay in place during sprinkler activation. This will



permit wood joists to be used as baffles where sprinklers are being installed in every pocket of obstructed construction.

**Soffits and Standard Spray Sprinklers (8.6.5.1.2(c)).** Where upright or pendent sprinklers are installed at the ceiling, no sprinkler is required underneath soffits that are more than 18 inches below the sprinkler deflector as long as they are not more than 2 ft wide.

**Clearance Below Deflectors with Objects Against Walls (8.6.6.2).** For a long time, NFPA 13 has required a minimum 18 inch clearance below pendent and upright sprinklers. For many years, an annex note stated that you did not need to worry about the 18 inch clearance when the object in question was against a wall because you did not need to worry about throwing water over the object to the other side. In the 2013 edition, that annex note has been moved to the body of the standard so that it can be legally enforced.

**Back-to-Back Sidewall Sprinklers (8.7.3.1.4.1).** Sidewall sprinklers have always been permitted to be installed back-to-back (facing in opposite directions) as long as a soffit or baffle was installed between them, but the standard has never been clear on how wide this soffit is allowed to be. If a soffit was too wide, it would allow a large dry spot to be unprotected with water spray. In the 2013 edition, this new section clarifies that the maximum width of the soffit is 16 inches. If the soffit on which back-to-back sidewall sprinklers are being installed exceeds 16 inches, then a pendent sprinkler needs to be installed in the soffit as well. The 16 inches makes sense as a maximum width because it is twice the allowable 8 inch width of a soffit on which a single sprinkler can be installed.

**Baffles Between Sidewall Sprinklers (8.7.3.4).** The standard has technically not allowed sidewall sprinklers to be spaced closer than 6 ft, even with baffles between the sprinklers. Logic would say that it is okay to install sprinklers in such a manner, but the standard has not said that until now. In the 2013 edition, baffle rules have been added and standardized with the upright and pendent sprinkler rules in 8.6. The baffles can be of any solid and rigid materials that will stay in place during sprinkler activation, which will permit wood joists to be used as baffles where sprinklers are being installed in every pocket of obstructed construction.

**Soffits on Walls Opposite Sidewall Sprinklers (8.7.5.1.6).** Obstructions on walls opposite from the sidewall sprinkler are not a concern as long as they are no more than 2 ft down from the ceiling and 2 ft out from the wall, even if they do not comply with 8.7.5.1.3.

**Baffles Between Extended Coverage Sprinklers (8.8.3.4.2).** Where extended coverage upright and pendent sprinklers are spaced closer than 8 ft, the standard has always permitted the situation as long as there are baffles between the sprinklers. In the 2013 edition, the baffle rules have been changed so that they no longer have to be noncombustible. The baffles now only need to be solid and rigid materials that will stay in place during sprinkler activation. This will permit wood joists to be used as baffles where sprinklers are being installed in every pocket of obstructed construction (see 8.4.3(6)).

**Soffits and Extended Coverage Sprinklers (8.8.5.1.2(c)).** Where upright or pendent extended coverage sprinklers are installed at the ceiling, no sprinkler is required underneath soffits that are more than 18 inches below the sprinkler deflector as long as they are not more than 2 ft wide.

**Baffles Between Extended Coverage Sidewall Sprinklers (8.9.3.4).** Extended coverage sidewall sprinklers have not been permitted to be installed within the protection area of another sprinkler, even if baffles are installed between the sprinklers. Logic would say that it is okay to install sprinklers in such a manner, but the standard has not said that until now. In the 2013 edition, baffle rules have been added and standardized with the upright and pendent sprinkler rules in 8.6. The baffles can be of any solid and rigid materials that will stay in place during sprinkler activation, which will permit wood joists to be used as baffles where sprinklers are being installed in every pocket of obstructed construction (see 8.4.3(6)).

**Soffits on Walls Opposite Sidewall Sprinklers (8.9.5.1.6).** Obstructions on walls opposite from the sidewall extended coverage sprinkler are not a concern as long as they are no more than 2 ft down from the ceiling and 2 ft out from the wall, even if they do not comply with 8.9.5.1.3.

**Baffles Between Residential Sprinklers (8.10.3.3 and 8.10.3.4).** Residential sprinklers (pendent and sidewall) have not been permitted to be installed within 8 ft of each other or within the protection area of another sprinkler, even if baffles are installed between the sprinklers. Logic would say that it is okay to install sprinklers in such a manner, but the standard has not said that until now. In the 2013 edition, baffle rules have been added and standardized with the upright and pendent sprinkler rules in 8.6. The baffles can be of any solid and rigid materials that will stay in place during sprinkler activation.



**Soffits and Standard Spray Sprinklers (8.10.6.1.2(c)).** Where upright or pendent residential sprinklers are installed at the ceiling, no sprinkler is required underneath soffits that are more than 18 inches below the sprinkler deflector as long as they are not more than 2 ft wide.

**Soffits on Walls Opposite Sidewall Sprinklers (8.10.7.1.6).** Obstructions on walls opposite from the sidewall residential sprinkler are not a concern as long as they are no more than 2 ft down from the ceiling and 2 ft out from the wall, even if they do not comply with 8.10.7.1.3.

**Sprigs for Upright CMSA Sprinklers (8.11.5.2.2).** In the past, k-11.2 upright CMSA (or large drop) sprinklers were required to be elevated over 2½-inch or 3-inch branch lines. In the 2013 edition, they are not required to be installed on sprigs. Instead, the sprinklers are only required to be installed on sprigs when the branch line exceeds 4-inch in nominal diameter.

**Upright ESFR Sprinklers and Small Obstructions (8.12.5.3.2.1).** Upright ESFR sprinklers have always been allowed to be installed without concern for small (less than 4-inch wide) obstructions such as the bottom chords of bar joists. But this information has always been stated in the manufacturer's listing instead of the standard. Now it is in the 2013 edition of NFPA 13.

**Filling a Space with Noncombustible Insulation (8.15.1.2.7.1).** When NFPA 13 permits sprinklers to be omitted from a combustible concealed space that is filled with insulation, how much insulation is required? Is any air gap allowed at the top? Previous editions have been silent on this issue, but the 2013 edition answers the question by permitting a 2-inch air gap at the top of the insulation to allow for settling of the insulation and air flow.

**Sprinklers at the Bottom of Stairwells (8.15.3.2.3.1).** A long-standing practice has been to allow sprinklers to be omitted from the bottom of stairwells as long as the space at the bottom is blocked off so that storage cannot occur. This practice is now explicitly in the standard.

**Elevator Machine Rooms (8.15.5.3).** Sprinklers will not be required in elevator machine rooms and elevator machinery spaces, control spaces or hoistways of traction elevators where all of the following conditions are met:

- (1) The spaces are dedicated to elevator equipment only.
- (2) The spaces are protected by smoke detectors, or other automatic fire detection
- (3) The spaces are separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire resistance rating of not less than that specified by the applicable building code.
- (4) No materials unrelated to elevator equipment are permitted to be stored in the spaces
- (5) The elevator machinery is not of the hydraulic type.

**Bathrooms in Dwelling Units (8.15.8.1.1).** Sprinklers will only be permitted to be omitted from bathrooms in hotel and motel guest rooms. This will require sprinklers in bathrooms of apartments, condos, dorms, rooming houses, etc. when using NFPA 13

**Closets in Hospital Patient Rooms (8.15.9).** Closets in hospital patient rooms that do not exceed 6 sq ft do not need sprinklers as long as the sprinkler in the patient room can cover to the back of the closet

**Return Bends for Big Orifice Pendent Sprinklers (8.15.19.5).** Pendent sprinklers with orifice sizes k-11.2 or larger that are supplied by raw water sources will not be required to be installed on return bends. The theory is that the larger orifice will make it more difficult for sediment to settle on the sprinkler and prevent the sprinkler from opening.

**Floor Control (8.16.1.5).** A floor control valve, check valve, main drain, and flow switch will be required for each floor of a building unless the total area of all floors combined does not exceed the system protection area limitations of 8.2.1 (52,000 sq ft for light and ordinary hazard; 40,000 sq ft for extra hazard and storage). The top story of a building will not be required to have a separate floor control assembly if it is fed from the floor below, which is a design that many people like to protect pipe from freezing when feeding sprinklers on the top floor.

**Sharing Support with Other Building Systems (9.1.1.3).** A section has been added to the standard to clarify that sprinkler system hangers can be combined with hangers for other building systems, as long as this section is followed.

**Hangers for Short Sections of Branch Lines (9.2.3.2.5).** A basic rule of NFPA 13 for support of sprinklers is that every piece of pipe needs a hanger. But for short sections of pipe (such as where a branch line goes around



an obstruction) the standard has never clearly stated that hangers can be omitted until now. The 2013 edition says that individual pieces of branch lines do not need hangers as long as the total distance between hangers on the branch line (measured along the branch line) does not exceed the maximum allowable distance between hangers.

**Hangers for Short Sections of Mains (9.2.4.7).** A basic rule of NFPA 13 for support of sprinklers is that every piece of pipe needs a hanger. But for short sections of pipe (such as where a main goes around an obstruction) the standard has never clearly stated that hangers can be omitted until now. The 2013 edition says that individual pieces of mains do not need hangers as long as the total distance between hangers on the main (measured along the main) does not exceed the maximum allowable distance between hangers.

**Sharing Earthquake Braces with Other Building Systems (9.3.5.1.4).** A section has been added to the standard to clarify that sprinkler system earthquake braces can be combined with braces for other building systems, as long as this section is followed.

**Brace Materials (9.3.5.3).** Brace materials are required to be ferrous unless proven in fire tests to be adequate for the hazard and listed for the purpose.

**Changes in Pipe Direction (9.3.5.7).** Clarification on how to handle longitudinal and lateral braces when the main (or branch line) being braced changes direction.

**Long Riser Nipples (9.3.5.9.6.1).** Where riser nipples (connections from mains to branch lines) are more than 4 ft long, a special calculation needs to be made for the lateral braces, or the branch lines need to be braced separately.

**Hangers in Concrete in Seismic Areas (9.3.7.8).** Concrete anchors used to secure hangers in areas where seismic protection is a part of the sprinkler system design are required to meet ACI 355.2 Qualifications of Post-Installed Mechanical Anchors in Concrete and Commentary.

**Injection System Information on Signs (25.6.2).** The information required on the general information sign was revised to include data on chemicals injected into the system for MIC or corrosion inhibitors such as the type of chemical, the concentration of the chemical, and where to get information on the proper disposal of the chemical.



### Upcoming NFSA “Technical Tuesday” Seminar – February 5

*Topic: Backflow Preventers and Sprinkler Systems*

*Instructors: James D. Lake*

*Date: Tuesday, February 5, 2013- 10:30 am EST*

Backflow is the process by which water from within a system that is connected to a potable water supply “flows backward” from the system into the water supply piping. Because sprinkler systems are typically connected to the municipal potable water supply there is concern on the part of the water purveyors regarding the potential for sprinkler system water to backflow into the potable system resulting in contamination. This seminar will explore the background of concerns on the part of water authorities; the subsequent impact of regulations on sprinkler system installations, and how the impact can be mitigated.

To register or for more information, click [HERE](#) or contact Michael Repko at (845) 878-4207 or e-mail to [seminars@nfsa.org](mailto:seminars@nfsa.org).

### Upcoming In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country, and in recognition of the current recession has adopted a new reduced fee structure. Here are some upcoming seminars:

Feb 12	Bettendorf, IA	Acceptance Testing & Hydraulics for Plan Reviewers
Feb 13	Bettendorf, IA	Understanding, Applying & Enforcing NFPA 25
Feb 19-21	Atlanta, GA	3-Day Inspection & Testing for the Sprinkler Industry
Mar 12	Pataskala, OH	Inspection, Testing & Maintenance for the AHJ
Mar 13	Pataskala, OH	Hydraulics for Fire Protection
Mar 14	Pataskala, OH	Foam Water Systems/Basic Seismic Protection

*These seminars qualify for continuing education as required by NICET, and meet mandatory Continuing Education Requirements for Businesses and Authorities Having Jurisdiction.*

**To register for these in-class seminars, click [HERE](#). Or contact Michael Repko at (845) 878-4207 or e-mail to [seminars@nfsa.org](mailto:seminars@nfsa.org) for more information.**

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***About the National Fire Sprinkler Association***

*Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country. [www.nfsa.org](http://www.nfsa.org).*

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