



Public Input No. 4-NFPA 13D-2024 [Global Input]

1670 Sprinkler Systems in Residential Occupancies

1670.1 All new single family dwellings constructed after June 15, 1999 shall contain an automatic sprinkler system that meets the requirements of NFPA 13D Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, 1996 Edition.

1670.2 All new manufactured homes that are installed in this jurisdiction after June 15, 1999 shall be equipped with automatic sprinkler systems that meet the requirements of NFPA 13D Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, 1996 Edition.

1670.3 All new multiple family residential occupancies constructed and occupied after June 15, 1999 shall be equipped with automatic sprinkler systems that meet the requirements of NFPA 13R Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height.

Statement of Problem and Substantiation for Public Input

New Sprinkler system requirements.

Submitter Information Verification

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Submittal Date: Thu Nov 14 15:59:12 EST 2024

Committee: AUT-RSS

Committee Statement

Resolution: These are code requirements not suitable for NFPA 13D. The requirements proposed are addressed in the building and fire codes whereas this is an installation standard. The proposal also appears to be retroactive.

**Public Input No. 42-NFPA 13D-2025 [Global Input]**

See attached document

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
.1749052411493 NFPA_13D_Reorganization.docx	Reorg of NFPA 13D	

Statement of Problem and Substantiation for Public Input

NFPA 13D (and 13R) are not organized like NFPA 13. This can lead to confusion, and it would be advantageous for all the sprinkler installation standards to follow the same format. This concept was discussed last cycle and the committee should generally have a positive reaction. The uploaded reorganized 13D document was originally submitted for 2022 edition and may need some updating. If the committee agrees with this concept, it may be prudent to establish a Task Group to review.

Submitter Information Verification

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Submittal Date: Wed Jun 04 11:48:55 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: The committee acknowledges that the reorganization of NFPA 13D is important and wants to ensure that it is done prior to a first draft meeting and revision such that sufficient public scrutiny can occur. A task group is being formed to work on the project in advance of the next cycle.

General Outline

NFPA 13R & NFPA 13D Reorganization

Chapter 1 Administration

Chapter 2 Referenced Publications

Chapter 3 Definitions

Chapter 4 General Requirements

Chapter 5 Water Supplies

Chapter 6 Installation Underground Piping

Chapter 7 Requirements for System Components and Hardware

Chapter 8 System Types and Requirements

Chapter 9 Sprinkler Location Requirements

Chapter 10 Installation Requirements for Sprinklers

Chapter 11 Installation of Piping, Valves, and Appurtenances

Chapter 12 Installation Requirements for Hanging and Support of System Piping

Chapter 13 Design Approaches

Chapter 14 Special Occupancy

Chapter 15 Plans and Calculations

Chapter 16 Systems Acceptance

Chapter 17 Existing System Modifications

Chapter 18 System Inspection, Testing, and Maintenance

Annex

NFPA 13D Reorganization

Chapter 1 Administration

1.1* Scope.

1.1.1 This standard shall cover the design, installation, and maintenance of automatic sprinkler systems for protection against the fire hazards in one- and two-family dwellings, manufactured homes, and townhouses.

1.1.2 This standard shall not provide requirements for the design or installation of water mist fire protection systems, which are not considered fire sprinkler systems and are addressed by NFPA 750.

1.1.3 This standard shall be based on the concept that the sprinkler system is designed to protect against a fire originating from a single ignition location.

1.2* Purpose.

1.2.1 The purpose of this standard shall be to provide a sprinkler system that aids in the detection and control of residential fires and thus provides improved protection against injury and life loss.

1.2.2 A sprinkler system shall be designed and installed in accordance with this standard to prevent flashover (total involvement) in the room of fire origin, where sprinklered, and to improve the chance for occupants to escape or be evacuated.

1.3 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.3.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.3.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.3.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.4 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.4.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.5 Units.

1.5.1* Metric units of measurement in this standard shall be in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 The liter and bar units shall be permitted to be used in this standard.

1.5.3 The conversion factors for liter, pascal, and bar shall be in accordance with Table 1.5.3.

Table 1.5.3 Metric Conversions

1.5.4* Where a value for measurement as specified in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement.

1.5.5 The equivalent value for a measurement in SI shall be converted by multiplying the value by the conversion factor and then rounding the result to the appropriate number of significant digits.

1.6 New Technology.

1.6.1 Nothing in this standard shall be intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered.

1.6.2 Materials or devices not specifically designated by this standard shall be utilized in complete accord with all conditions, requirements, and limitations of their listings.

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 13, Standard for the Installation of Sprinkler Systems, 2022 edition.

NFPA 70®, National Electrical Code®, 2020 edition.

NFPA 72®, National Fire Alarm and Signaling Code®, 2022 edition.

NFPA 220, Standard on Types of Building Construction, 2021 edition.

NFPA 750, Standard on Water Mist Fire Protection Systems, 2019 edition.

2.3 Other Publications.

2.3.1 ASME Publications.

American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

ASME B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250, 2015.

ASME B16.3, Malleable Iron Threaded Fittings: Classes 150 and 300, 2016.

ASME B16.4, Gray Iron Threaded Fittings: Classes 125 and 250, 2016.

ASME B16.5, Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard, 2017.

ASME B16.9, Factory-Made Wrought Butt welding Fittings, 2018.

ASME B16.11, Forged Fittings, Socket-Welding and Threaded, 2016.

ASME B16.15, Cast Copper Alloy Threaded Fittings: Classes 125 and 250, 2018.

ASME B16.18, Cast Copper Alloy Solder-Joint Pressure Fittings, 2018.

ASME B16.22, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings, 2018.

ASME B16.25, Butt welding Ends, 2017.

ASME B36.10M, Welded and Seamless Wrought Steel Pipe, 2018.

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless, 2018.

ASTM A135/A135M, Standard Specification for Electric-Resistance-Welded Steel Pipe, 2019.

ASTM A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service, 2019.

ASTM A795/A795M, Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use, 2013 (2020).

ASTM B32, Standard Specification for Solder Metal, 2008, reapproved 2014.

ASTM B43, Standard Specification for Seamless Red Brass Pipe, Standard Sizes, 2020.

ASTM B75/B75M, Standard Specification for Seamless Copper Tube, 2020.

ASTM B88, Standard Specification for Seamless Copper Water Tube, 2020.

ASTM B251/B251M, Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube, 2017.

ASTM B813, Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper-Alloy Tube, 2016.

ASTM B828, Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings, 2016.

ASTM F437, Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80, 2015.

ASTM F438, Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40, 2017.

ASTM F439, Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80, 2019.

ASTM F442/F442M, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR), 2019.

ASTM F876, Standard Specification for Crosslinked Polyethylene (PEX) Tubing, 2019a.

2.3.3 AWS Publications.

American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166-6672.

AWS A5.8M/A5.8, Specification for Filler Metals for Brazing and Braze Welding, 2011, Amendment 1, 2012.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 13R, Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies, 2022 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. Merriam-Webster's Collegiate Dictionary, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be

considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Back-to-Back Townhouse.

See 3.3.16.1.

3.3.2* Bathroom. Within a dwelling unit, any room or compartment containing a lavatory dedicated to personal hygiene, or a water closet, or bathing capability such as a shower or tub, or any combination of facilities thereof.

3.3.3 Compartment. A space completely enclosed by walls and a ceiling. Each wall in the compartment is permitted to have openings to an adjoining space if the openings have a minimum lintel depth of 8 in. (200 mm) from the ceiling and the total width of the openings in a single wall does not exceed 8 ft (2.4 m) in width. A single opening of 36 in. (900 mm) or less in width without a lintel is permitted when there are no other openings to adjoining spaces.

3.3.4 Design Discharge. The rate of water discharged by an automatic sprinkler expressed in gpm (mm/min).

3.3.5 Dwelling. Any detached building, or any part of a townhouse, back-to-back townhouse, or stacked townhouse structure that is separated from the remainder of the townhouse structure with fire resistance rated assemblies in accordance with local building code, that contains no more than two dwelling units intended to be used, rented, leased, let, or hired out to be occupied or that are occupied for habitation purposes.

3.3.6 Dwelling Unit. One or more rooms, arranged for the use of one or more individuals living together, as in a single housekeeping unit, that normally have cooking, living, sanitary, and sleeping facilities.

3.3.7* Manufactured Home. A structure, transportable in one or more sections, which, in the traveling mode, is 8 body-ft (2.4 m) or more in width or 40 body-ft (12 m) or more in length or, when erected on site, is 320 ft² (30 m²) or more and which is built on a permanent chassis and designed to be used as a dwelling, with or without a permanent foundation, when connected to the required utilities, and includes plumbing, heating, air-conditioning, and electrical systems contained therein; except that such terms include any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency. Calculations used to determine the number of square feet in a structure are based on the structure's exterior dimensions, measured at the largest horizontal projections when erected on site. These dimensions include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows.

3.3.8* Premixed Antifreeze Solution. A mixture of an antifreeze material with water that is prepared and factory-mixed by the manufacturer with a quality control procedure in place that ensures that the antifreeze solution remains homogeneous and that the concentration is as specified.

3.3.9 Pressure.

3.3.9.1 Supply Pressure. The pressure within the supply (e.g., city or private supply water source).

3.3.9.2 System Pressure. The pressure within the system (e.g., above the control valve).

3.3.9.3 System Working Pressure. The maximum anticipated static (nonflowing) or flowing pressure applied to sprinkler system components exclusive of surge pressures.

3.3.10 Pump. A mechanical device that transfers or raises, or transfers and raises, the pressure of a fluid (water).

3.3.11* Shadow Area. The dry floor area within the protection area of a sprinkler created by the portion of sprinkler discharge that is blocked by a wall or partition.

3.3.12 Sprinkler.

3.3.12.1 Automatic Sprinkler. A fire suppression or control device that operates automatically when its heat-actuated element is heated to its thermal rating or above, allowing water to discharge over a specific area.

3.3.12.2 Residential Sprinkler. A type of fast-response sprinkler having a thermal element with an RTI of 50 (meters-seconds)^{1/2} or less, that has been specifically investigated for its ability to enhance survivability in the room of fire origin, and that is listed for use in the protection of dwelling units.

3.3.13 Sprinkler Systems.

3.3.13.1 Antifreeze Sprinkler System. A wet pipe system using automatic sprinklers that contains a liquid solution to prevent freezing of the system, intended to discharge the solution upon sprinkler operation, followed immediately by water from a water supply.

3.3.13.2 Dry Pipe Sprinkler System. A sprinkler system employing automatic sprinklers that are attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as a dry pipe valve, and the water then flows into the piping system and out the opened sprinkler.

3.3.13.3* Multipurpose Piping Sprinkler System. A piping system intended to serve both domestic needs in excess of a single fixture and fire protection needs from one common piping system throughout the dwelling unit(s).

3.3.13.4* Network Sprinkler System. A type of multipurpose system utilizing a common piping system supplying domestic fixtures and fire sprinklers where each sprinkler is supplied by a minimum of three separate paths.

3.3.13.5* Passive Purge Sprinkler System. A type of sprinkler system that serves a single toilet in addition to the fire sprinklers.

3.3.13.6 Preaction Sprinkler System. A sprinkler system employing automatic sprinklers that are attached to a piping system that contains air that might or might not be under pressure, with a supplemental detection system in-stalled in the same areas as the sprinklers.

3.3.13.7 Pre-Engineered Sprinkler System. A packaged sprinkler system including all components connected to the water supply and designed to be installed according to pretested limitations.

3.3.13.8 Sprinkler System. A system that consists of an integrated network of piping designed in accordance with fire protection engineering standards that includes a water supply source, a water control valve, and a drain. 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.

3.3.13.9* Stand-Alone Sprinkler System. A sprinkler system where the aboveground piping serves only fire sprinklers.

3.3.13.10 Wet Pipe Sprinkler System. A sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire.

3.3.14 Townhouse. A one-family dwelling constructed in attached groups of three or more units as defined in the local building code.

3.3.15 Valve.

3.3.15.1 Check Valve. A valve that allows flow in one direction only.

3.3.15.2* Control Valve. An indicating valve employed to control (shut) a supply of water to a sprinkler system.

3.3.16 Waterflow Alarm. A sounding device activated by a waterflow detector or alarm check valve.

3.3.17 Waterflow Detector. An electric signaling indicator or alarm check valve actuated by water flow in one direction only.

Chapter 4 General Requirements

4.3 Listed or Labeled. Listed or labeled devices and materials shall be installed and used in accordance with the listing limitations and the manufacturers' instructions unless permitted by other sections of this document.

5.1.2 Except as permitted by 5.1.2.1, devices and materials used in sprinkler systems shall be listed.

5.1.2.1 The following devices and components shall not be required to be listed:

- (1) Water supply pipe and fittings
- (2) Tanks
- (3) Expansion tanks
- (4) Connections up to 5 ft (1.5 m) long between a tank and a pump
- (5) Pumps
- (6) Valves
- (7) Gauges
- (8) Waterflow detection and notification devices
- (9) Hangers
- (10) Backflow prevention devices approved by the water authority
- (11) Water meters

4.4* Documentation. Documentation shall be provided upon request to demonstrate that the water supply, listed devices, and sprinkler coverage comply with the requirements of this standard.

4.5 Qualifications. The layout, calculation, and installation of sprinkler systems installed in accordance with this standard shall only be performed by people knowledgeable and trained in such systems.

Chapter 5 Water Supplies

6.1 General Provisions.

6.1.1 Every automatic sprinkler system shall have at least one automatic water supply.

6.1.2 Where stored water is used as the sole source of supply, the minimum quantity shall equal the water demand rate times 10 minutes unless permitted otherwise by 6.1.3.

6.1.3 Where stored water is used as the sole source of supply, the minimum quantity shall be permitted to equal the highest calculated water demand rate times 7 minutes where dwelling units meet the following criteria:

- (1) One story in height
- (2) Less than 2000 ft² (185 m²) in area

6.1.4 The stored water requirement of 6.1.2 or 6.1.3 shall be permitted to be a combination of the water in the well, including the refill rate, plus the water in the holding tank if such tank can supply the sprinkler system.

6.1.5 The stored water supply requirement of 6.1.2 or 6.1.3 shall be permitted to be a combination of the water in the storage tank and the refill rate when the refilling method is automatic.

6.1.6 The automatic means requirement of 6.1.5 shall be permitted to be a float valve or similar device.

6.2* Water Supply Sources. The following water supply sources shall be considered to be acceptable by this standard:

(1) A connection to a reliable waterworks system with or without an automatically operated pump

(2) An elevated tank

(3) A pressure tank designed to American Society of Mechanical Engineers (ASME) standards for a pressure vessel with a reliable pressure source

(4) A stored water source with an automatically operated pump

(5) A well with a pump of sufficient capacity and pressure to meet the sprinkler system demand

6.2.1 Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

(1) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler K-factor on the system.

(2) Pump motors using ac power shall be rated for 240 V and wired in accordance with the NEC (NFPA 70).

(3) Any disconnecting means for the pump shall be approved.

(4) The pump shall be located not less than 11/2 in. off the floor.

6.2.2 Where a pump and tank is the source of supply for a fire sprinkler system but is not a portion of the domestic water system, the requirements of 6.2.1 and the following shall be met:

(1) The test connection shall return water to the tank.

(2) A method for refilling the tank shall be piped to the tank.

(3) A method of determining the water level in the tank shall be provided without having to open the tank.

6.2.3* Where more than one dwelling unit is served by the same water supply pipe, each dwelling unit shall have an individual control valve that serves the fire sprinkler system in that dwelling unit and the owner shall have access to the valve that controls the sprinkler system in their unit.

6.2.3.1 The control valve shall be permitted to serve the domestic water supply.

6.2.3.2 In the situation addressed by 6.2.3, no valve controlling the sprinkler system in a unit shall be located in another unit.

6.2.3.3* Where a well pump is the source of supply for both the fire sprinkler system and the domestic water system 6.1.4 and Section 6.5 shall apply.

6.3* Multipurpose Piping System.

6.3.1 A multipurpose piping system shall be installed in accordance with 6.3.2 through 6.3.4.

6.3.2 Multipurpose piping systems shall be approved by the local plumbing or health authority.

6.3.3 All piping in the system supplying sprinklers shall be listed and conform to the piping specifications of this standard.

6.3.3.1 Piping connected to the system that supplies only plumbing fixtures shall comply with local plumbing and health authority requirements but is not required to be listed.

6.3.4 A warning sign, with minimum 1/4 in. (6 mm) letters, shall be affixed adjacent to the main shutoff valve and shall state the following:

WARNING: THE WATER SYSTEM FOR THIS HOME SUPPLIES FIRE SPRINKLERS THAT REQUIRE CERTAIN FLOWS AND PRESSURES TO FIGHT A FIRE. DEVICES THAT RESTRICT THE FLOW OR DECREASE THE PRESSURE OR AUTOMATICALLY SHUT OFF THE WATER TO THE FIRE SPRINKLER SYSTEM, SUCH AS WATER SOFTENERS, FILTRATION SYSTEMS, AND AUTOMATIC SHUTOFF VALVES, SHALL NOT BE ADDED TO THIS SYSTEM WITHOUT A REVIEW OF THE FIRE SPRINKLER SYSTEM BY A FIRE PROTECTION SPECIALIST. DO NOT REMOVE THIS SIGN.

6.4 Manufactured Home Water Supply. For sprinklered buildings manufactured offsite, the minimum flow and pressure needed to satisfy the system design criteria on the system side of the meter shall be specified on a data plate by the manufacturer.

6.5 Common Supply Pipes.

6.5.1 Where common supply pipes serve both fire sprinkler and domestic use, they shall comply with 6.5.2 and 6.5.3.

6.5.2 In common water supply connections serving more than one dwelling unit, 5 gpm (20 L/min) shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler.

6.5.3 Where water treatment and filtration are installed, one of the following conditions shall be met:

(1) The flow restriction and pressure loss through the water treatment equipment shall be taken into account in the hydraulic calculations.

(2) An automatic bypass shall be installed around the water treatment equipment that directs all water directly to the system.

Chapter 6 Installation Underground Piping

5.3* Water Supply Pipe and Fittings. Any type of pipe or tube acceptable under the applicable plumbing code for aboveground or underground supply pipe shall be acceptable as a supply for these portions of a fire sprinkler system when in-stalled as follows and in accordance with manufacturer's recommendations:

(1) Between the point of connection and the water supply source

(2) Between a remote system riser and the dwelling or home

Chapter 7 Requirements for System Components and Hardware

7.5 Sprinklers.

7.5.1 Listed residential sprinklers shall be used unless another type is permitted by 7.5.3, 7.5.4, or 7.5.5. (See A.10.2.)

7.5.2 Residential sprinklers shall not be used on systems other than wet pipe systems unless specifically listed for use on that particular type of system.

7.5.3 Listed residential or quick-response standard spray dry pendent or dry sidewall sprinklers shall be permitted to be extended into unheated areas not intended for living purposes.

7.5.4 Quick-response sprinklers shall be permitted to be used in mechanical closets.

7.5.5* Quick-response spray sprinklers shall be permitted to be used in saunas and steam rooms in accordance with 7.5.6.3(4).

7.5.6 Temperature Ratings.

7.5.6.1 Sprinklers installed where maximum ambient ceiling temperatures do not exceed 100°F (38°C) shall be ordinary temperature-rated or intermediate-temperature rated sprinklers throughout unless modified by the requirements of 7.5.6.3.

7.5.6.2 Sprinklers installed where maximum ambient ceiling temperatures are between 101°F and 150°F (38°C and 65°C) shall be intermediate temperature-rated sprinklers unless modified by 7.5.6.3.

7.5.6.3* The following practices shall be observed when installing residential sprinklers unless higher expected ambient temperatures require a higher temperature rating:

(1) Sprinklers under glass or plastic skylights exposed to direct rays of the sun shall be of intermediate temperature classification.

(2) Sprinklers in an unventilated concealed space under an uninsulated roof or in an unventilated attic shall be of intermediate temperature classification.

(3)* Sprinklers installed near specific heat sources that are identified in Table 7.5.6.3 shall be of the temperature rating indicated in Table 7.5.6.3 unless sprinklers are listed for positioning closer to the heat source.

(4) Sprinklers installed in saunas and steam rooms where the maximum ambient ceiling temperatures are between 151°F and 225°F (66°C to 107°C) shall be high temperature-rated spray sprinklers.

(5) Sprinklers in closets containing ventless clothes dryers shall be of the intermediate temperature classification or higher.

Table 7.5.6.3 Minimum Distances for Ordinary and Intermediate Temperature Residential Sprinklers

7.5.7* Painting and Ornamental Finishes.

Sprinklers shall not be painted or enameled unless applied by the manufacturer and the sprinkler has been listed with such finishes.

7.5.8 Escutcheon Plates. Where nonmetallic sprinkler ceiling plates (escutcheons) or recessed escutcheons (metallic or nonmetallic) are used, they shall be listed based on testing of the assembly as a residential sprinkler.

7.5.9 Solvent Cement.

Where solvent cement is used as the pipe and fittings bonding agent, sprinklers shall not be installed in the fittings prior to the fittings being cemented in place.

5.2 Aboveground Pipe and Equipment.

4.2 Tube.

Wherever the word pipe is used in this standard, it shall also mean tube.

5.2.1

Listed residential sprinklers installed in systems complying with 5.2.2.3, 5.2.2.4, 5.2.5.3, or 5.2.5.4 shall be permitted to have a minimum pressure rating of 130 psi (9 bar).

5.2.2*

Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.2 or shall be in accordance with 5.2.3.

Table 5.2.2 Pipe or Tube Materials and Dimensions

5.2.2.1

The chemical properties, physical properties, and dimensions of pipe materials shall be at least equivalent to the standards cited in Table 5.2.2.

5.2.2.2* Pipe used in sprinkler systems other than those addressed in 5.2.2.3 or 5.2.2.4 shall be designed to withstand a working pressure of not less than 175 psi (12.2 bar).

5.2.2.3 Nonmetallic pipe used in multipurpose piping systems and passive purge systems not equipped with a fire department connection shall be designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C).

5.2.2.4 Nonmetallic pipe used in wet pipe sprinkler systems not equipped with a fire department connection and provided with a pressure-reducing valve set no higher than 80 psi (5.5 bar) shall be designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C) and 100 psi (6.9 bar) at 180°F (82°C).

5.2.2.4.1 If the maximum static pressure from the water supply is less than or equal to 80 psi (5.5 bar), pipe designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C) and 100 psi (6.9 bar) at 180°F (82°C) shall be permitted to be used without a pressure-reducing valve.

5.2.2.4.2 If a pressure-reducing valve is used to comply with 5.2.2.4, an automatic means of pressure relief shall be installed on the sprinkler system side of the pressure-reducing valve.

5.2.3 Types of pipe other than those specified in Table 5.2.2 shall be permitted to be used where listed for sprinkler system use.

5.2.3.1 Pipe differing from those specified in Table 5.2.2 shall be installed in accordance with their listings and the manufacturers' installation instructions.

5.2.3.2* Chlorinated polyvinyl chloride (CPVC) pipe and crosslinked polyethylene (PEX) pipe shall comply with the portions of the American Society for Testing and Materials (ASTM) standards specified in Table 5.2.3.2 that apply to fire protection service.

Table 5.2.3.2 Specifically Listed Pipe or Tube Materials and Dimensions

5.2.3.3 Where pipe other than steel is run horizontally or vertically through wood or metal studs, the following provisions shall apply:

(1) Steel shield plates shall be provided where the face of the piping is less than 1.25 in. (32 mm) from the nearest edge of the member.

(2) Steel shield plates shall have a minimum thickness of 0.0575 in. (1.463 mm) (No. 16 gauge).

(3) Steel shield plates shall cover the area of the pipe where the member is notched or bored.

5.2.4 Schedule 10 steel pipe shall be permitted to be joined with mechanical groove couplings approved for service.

5.2.4.1 Where mechanical groove couplings are used to join pipe, grooves shall be rolled on the pipe by an approved groove-rolling machine.

5.2.5 Fittings used in sprinkler systems shall be of the materials listed in Table 5.2.5 or shall be in accordance with 5.2.9.

Table 5.2.5 Fitting Materials and Dimensions

5.2.5.1 The chemical properties, physical properties, and dimensions of fitting materials shall be at least equivalent to the standards cited in Table 5.2.5.

5.2.5.2 Fittings used in sprinkler systems other than those addressed in 5.2.5.3 or 5.2.5.4 shall be designed to withstand a working pressure of not less than 175 psi (12.1 bar).

5.2.5.3 Nonmetallic fittings used in multipurpose piping systems and passive purge systems not equipped with a fire department connection shall be designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C).

5.2.5.4 Nonmetallic fittings used in wet pipe sprinkler systems not equipped with a fire department connection and provided with a pressure-reducing valve set no higher than 80 psi (5.5 bar) shall be

designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C) and 100 psi (6.9 bar) at 180°F (82°C).

5.2.5.4.1 If the maximum static pressure from the water supply is less than or equal to 80 psi (5.5 bar), fittings designed to withstand a working pressure of not less than 130 psi (9 bar) at 120°F (49°C) and 100 psi (6.9 bar) at 180°F (82.2°C) shall be permitted to be used without a pressure-reducing valve.

5.2.5.4.2 If a pressure-reducing valve is used to comply with 5.2.5.4, an automatic means of pressure relief shall be installed on the sprinkler system side of the pressure-reducing valve.

5.2.6 Joints for the connection of copper tube shall be brazed on dry pipe and preaction systems.

5.2.7 Joints for the connection of copper tube for wet pipe systems and antifreeze systems shall be solder joints or be brazed.

5.2.8 Solder joints, where permitted, shall be fabricated in accordance with the methods and procedures listed in ASTM B828, Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.

5.2.9 Types of fittings other than those specified in Table 5.2.5 shall be permitted to be used where listed for sprinkler system use.

5.2.9.1 Fittings differing from those specified in Table 5.2.5 shall be installed in accordance with their listings and the manufacturers' installation instructions.

5.2.9.2* CPVC fittings shall comply with the portions of the ASTM standards specified in Table 5.2.9.2 that apply to fire protection service.

Table 5.2.9.2 Specifically Listed Fittings Materials and Dimensions

5.2.10 Other joining methods investigated for suitability in automatic sprinkler installations and listed for this service shall be permitted.

7.6* Alarms.

Local waterflow alarms shall be provided on all sprinkler systems in homes not equipped with smoke alarms or smoke detectors in accordance with NFPA 72.

Chapter 8 System Types and Requirements

9.1 System Types. Systems shall be permitted to be wet pipe, dry pipe, or preaction.

9.1.1* Wet Pipe Systems. A wet pipe system shall be permitted to be used where all piping is installed in areas not subject to freezing, including areas properly insulated to maintain 40°F (4°C).

9.1.2 Systems in Areas Subject to Freezing.

9.1.2.1 Where any portion of a system is subject to freezing and the temperature cannot be maintained at or above 40°F (4°C), the pipe shall be protected against freezing by use of one of the following methods:

(1) Dry pipe system and preaction systems in accordance with Section 9.3

(2) Antifreeze system in accordance with Section 9.2

(3) Listed standard dry pendent or dry sidewall sprinklers extended from pipe in heated areas into unheated areas not intended for living purposes

(4)* Listed heat tracing provided that it is installed and insulated in accordance with manufacturer's instructions, specifically heat tracing used on branch lines is listed for branch lines of fire sprinkler systems

(5) Listed residential dry pendent or dry sidewall sprinklers extended from pipe in heated areas into unheated areas

9.1.2.2* The weather temperature used to determine if an unconditioned portion of a system is subject to freezing and required to be protected in accordance with 9.1.2 shall be the average annual extreme minimum temperature obtained from an approved source.

9.2* Antifreeze Systems.

9.2.1* Conformity with Health Regulations. The use of antifreeze solutions shall be in conformity with any state or local health regulations.

9.2.2* Antifreeze Solutions.

9.2.2.1 Except as permitted in 9.2.2.2, antifreeze solutions shall be listed for use in new sprinkler systems.

9.2.2.1.1 For existing systems, antifreeze solutions shall be limited to premixed antifreeze solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent) at a maximum concentration of 50 percent by volume, propylene glycol at a maximum concentration of 40 percent by volume, or other solutions listed specifically for use in fire protection systems.

9.2.2.2* Premixed solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent at a maximum concentration of 48 percent by volume or propylene glycol at a maximum concentration of 38 percent by volume shall be permitted to protect piping that is supplying sprinklers in a specific area of the dwelling unit, where acceptable to the authority having jurisdiction.

9.2.2.2.1* Documentation shall be presented to the AHJ to substantiate the use of the antifreeze solution.

9.2.2.3* The specific gravity of the antifreeze solution shall be checked by a hydrometer with a scale having 0.002 subdivisions.

9.2.3* Arrangement of Supply Piping and Valves.

9.2.3.1 Connections Between Antifreeze System and Wet Pipe System with No Backflow Prevention Device.

9.2.3.1.1 A 5 ft (1.5 m) drop pipe, or U-loop, shall be installed in the connection between the antifreeze system and the wet pipe system as illustrated in Figure 9.2.3.1.1.

Figure 9.2.3.1.1 Arrangement of Supply Piping and Valves.

9.2.3.1.2 If sprinklers are above the level of the water supply to the antifreeze system, a check valve with a 1/32 in. (0.8 mm) hole in the clapper shall be provided in the U-loop.

9.2.3.1.3 Valves shall be provided as illustrated in Figure 9.2.3.1.1.

9.2.3.1.4 Arrangement of supply piping when the water supply comes from a storage tank or the water supply feeds through a check valve that does not have a 1/32 in. (0.8 mm) hole drilled in the clapper shall meet the requirements of 9.2.3.2.2.

9.2.3.2* Connections Between Antifreeze System and Wet Pipe System with Backflow Prevention Device Installed.

9.2.3.2.1 Valves shall be provided as illustrated in Figure 9.2.3.2.1.

Figure 9.2.3.2.1 Arrangement of Supply Piping with Backflow Device.

9.2.3.2.2 An expansion chamber shall be provided as illustrated in Figure 9.2.3.2.1.

9.2.3.2.3 The expansion chamber shall be sized based on the minimum and maximum volume of the antifreeze solution over the life of the system.

9.2.4 Hydrostatic Test. Where pendent sprinklers are utilized, and where a hydrostatic test shall be performed, the hydrostatic test shall be performed with water and then the water shall be completely

drained before antifreeze solution is placed in the system, or the hydrostatic test shall be performed with antifreeze solution at the proper concentration for the system.

9.2.5 Placard Information.

A placard shall be placed on the antifreeze system main valve that indicates the manufacturer type and brand of antifreeze solution, the concentration of antifreeze solution used, and the volume of the antifreeze solution used in the system.

9.3 Dry Pipe and Preaction Systems.

9.3.1 Sprinklers.

9.3.1.1 Sprinklers shall be specifically listed for use on dry pipe and double interlock preaction systems.

9.3.1.2

The following types of sprinklers and arrangements shall be permitted for dry pipe and preaction systems:

(1) Residential upright sprinklers

(2) Residential dry sprinklers

(3) Residential pendent and sidewall sprinklers installed on return bends, where the sprinklers, return bends, and branch line piping are in an area maintained at or above 40°F (4°C)

(4) Residential horizontal sidewall sprinklers, installed so that water is not trapped

9.3.1.3 Return bends required per 9.3.1.2(3) shall be permitted to be omitted when using potable water supplies combined with corrosion-resistant pipe.

9.3.1.4 Sprinklers with nominal K-factors greater than 4.0 and less than 5.6 shall be permitted to be installed on dry pipe systems where piping is corrosion resistant or internally galvanized.

9.3.1.5 Sprinklers with nominal K-factors of 5.6 or greater shall be permitted to be installed on pipe complying with the requirements of Section 5.2.

9.3.2 Preaction Systems. Preaction systems shall be one of the following types:

(1) A single interlock system, which admits water to sprinkler piping upon operation of detection devices

(2) A noninterlock system, which admits water to sprinkler piping upon operation of detection devices or automatic sprinklers

(3) A double interlock system, which admits water to sprinkler piping upon operation of both detection devices and automatic sprinklers

9.3.3 Dry Pipe and Double Interlock Preaction System Water Delivery.

9.3.3.1 Water delivery shall be based on the hazard shown in Table 9.3.3.1.

Table 9.3.3.1 Water Delivery Time for Dry Pipe and Double Interlock Preaction Systems

9.3.3.2

Water delivery shall be based on one of the following:

(1) A calculation program and method that shall be listed by a nationally recognized laboratory

(2) An inspector's test connection providing a flow equivalent to the smallest sprinkler K-factor utilized, wherein the test connection is located on the end of the most remote branchline

9.3.4 Location and Protection of Dry Pipe and Preaction Valves. The dry pipe valve, preaction valve, and supply pipe shall be protected against freezing and physical damage.

9.3.5* Detection Devices.

9.3.5.1 The detection system shall be designed to operate sooner than the first sprinkler.

9.3.5.2 Detectors shall be installed in all areas and compartments where sprinklers are installed.

9.3.6 System Configuration.

Dry pipe systems and preaction systems of the type described in 9.3.2(3) shall not be gridded.

9.3.7 Drainage. Piping shall be pitched a minimum of 1/4 in. per 10 ft (6 mm per 3 m) to facilitate draining.

9.3.8 Auxiliary Drains.

9.3.8.1 Auxiliary drains shall be provided where a change in piping direction prevents drainage of system piping through the drain valve on the system side of the control valve.

9.3.8.2 At a minimum, auxiliary drains shall be a nipple and cap or plug not less than 1/2 in. (13 mm).

9.3.9 Air Supply.

The system air pressure shall be maintained by approved equipment.

Chapter 9 Sprinkler Location Requirements

8.3 Location of Sprinklers.

8.3.1 Sprinklers shall be installed in all areas except where omission is permitted by 8.3.2 through 8.3.7.

8.3.2 Sprinklers shall not be required in bathrooms of 55 ft² (5.1 m²) and less.

8.3.3 Sprinklers shall not be required in clothes closets, linen closets, and pantries that meet all of the following conditions:

(1) The area of the space does not exceed 24 ft² (2.2 m²).

(2) The walls and ceilings are surfaced with noncombustible or limited-combustible materials as defined in NFPA 220.

8.3.4* Sprinklers shall not be required in garages, open attached porches and balconies, carports, and similar structures.

8.3.5 Sprinklers shall not be required in attics with or without storage, penthouse equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment, floor/ceiling spaces, vertical chases, elevator shafts, crawl spaces, and other concealed spaces that are not used or intended for living purposes.

8.3.5.1 Such spaces that contain fuel-fired equipment shall also comply with 8.3.5.1.1 or 8.3.5.1.2.

8.3.5.1.1 Where fuel-fired equipment is located other than beneath an occupied area of the dwelling unit, sprinkler protection shall not be required based on the presence of the fuel-fired equipment.

8.3.5.1.2* Where fuel-fired equipment is located beneath an occupied area of the dwelling unit, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.

8.3.6* Sprinklers shall not be required in unheated enclosures at the building at entrances/exits as long as the dwelling unit has another entrance/exit.

8.3.7 Sprinklers shall not be required for ceiling pockets that meet the following conditions:

(1) The total volume of all unprotected ceiling pockets in a compartment does not exceed 100 ft³ (2.8 m³).

(2) The entire floor under the unprotected ceiling pocket is protected by sidewall or pendent sprinklers at the lower ceiling elevation.

(3)* The interior finish of the unprotected ceiling pocket excluding decorative treatments is noncombustible or limited-combustible material.

(4) Skylights not exceeding 32 ft² (3 m²) shall be permitted to have a plastic cover.

8.3.8 Sprinklers shall not be required in closets in garages and exterior closets (regardless of size) located on exterior balconies, exterior breezeways/corridors, or accessed from outdoors where the closet does not have doors or unprotected penetrations directly into the dwelling unit.

8.3.9 Sprinklers shall be installed in any closet used for heating and/or air-conditioning equipment, washers and/or dryers, or water heaters except as allowed by 8.3.8.

9.4.2 Temperature Ratings.

4.1.1 Sprinklers having a temperature rating of 135°F to 170°F (57°C to 77°C) shall be classified as ordinary temperature-rated sprinklers.

4.1.2 Sprinklers having a temperature rating of 175°F to 225°F (79°C to 107°C) shall be classified as intermediate temperature-rated sprinklers.

4.1.3 Sprinklers having a temperature rating of 250°F to 300°F (121°C to 149°C) shall be classified as high temperature-rated sprinklers.

Chapter 10 Installation Requirements for Sprinklers

8.2 Position of Sprinklers.

8.2.1 Residential Pendent and Upright Sprinklers.

8.2.1.1 Pendent and upright sprinklers that have not been listed with specific deflector to ceiling distances shall be positioned so that the deflectors are within 1 in. to 4 in. (25 mm to 100 mm) from the ceiling unless otherwise permitted by 8.2.7 or 8.2.1.2.

8.2.1.2* Pendent-type residential sprinklers located under or adjacent to beams in accordance with 10.2.1 shall be installed in accordance with one of the following:

- (1) Pendent, recessed pendent, concealed, and flush-type pendent sprinklers shall be permitted to be installed directly under a beam having a maximum depth of 14 in. (350 mm) with the sprinkler deflector 1 in. to 2 in. (25 mm to 50 mm) below the beam, or in accordance with the manufacturer's instructions for recessed or flush sprinklers if the deflector is less than 1 in. (25 mm) below the beam, as shown in Figure 8.2.1.2(a).
- (2) Pendent sprinklers shall be permitted to be installed adjacent to beams where the vertical centerline of the sprinkler is no greater than 2 in. (50 mm) from the edge of the beam and with the sprinkler deflector 1 in. to 2 in. (25 mm to 50 mm) below the beam, or in accordance with the manufacturer's instructions for flush sprinklers if the deflector is less than 1 in. (25 mm) below the beam, as shown in Figure 8.2.1.2(b).

Figure 8.2.1.2(a) Position of Sprinkler Under a Beam.

Figure 8.2.1.2(b) Position of Sprinkler Adjacent to a Beam.

8.2.1.3 Pendent and upright sprinklers that have been listed with specific positioning criteria shall be positioned in accordance with their listing unless permitted otherwise by 8.2.7.

8.2.2 Residential Sidewall Sprinklers.

8.2.2.1 Sidewall sprinklers that have not been listed with specific positioning criteria shall be positioned so that the deflectors are within 4 in. to 6 in. (100 mm to 150 mm) from the ceiling.

8.2.2.2 Sidewall sprinklers that have been listed with specific positioning criteria shall be installed in accordance with their listing.

8.2.2.3 Residential horizontal sidewall sprinkler deflectors shall be located no more than 6 in. (150 mm) from the face of the wall or soffit on which they are mounted.

8.2.3 Nonresidential Sprinklers. Sprinklers other than residential sprinklers shall be positioned in accordance with the positioning criteria specified by NFPA 13.

8.2.4 Basements Without Ceilings. In basements where ceilings are not required for the protection of piping or where metallic pipe is installed, residential sprinklers shall be permitted to be positioned in a manner that anticipates future installation of a finished ceiling.

8.2.5* Obstructions to Residential Sprinklers.

8.2.5.1 Pendent Sprinklers.

8.2.5.1.1 Pendent sprinklers shall be located at least 36 in. (900 mm) away from obstructions such as ceiling fans and light fixtures unless the requirements of 8.2.5.3 are met.

8.2.5.1.2 The distance shall be measured from the center of the sprinkler to the center of the obstruction.

8.2.5.1.3 Where the sprinkler cannot be located 36 in. (900 mm) away from the obstruction (as measured from the center of the obstruction), an additional sprinkler shall be located on the other side of the obstruction.

8.2.5.1.4 Where the area of the fan blades encompass more than 50 percent of the area of the plan view, the sprinkler shall be installed in accordance with 8.2.5.3.

8.2.5.1.5 In hallways up to 6 ft (1.8 m) in width, sprinklers shall be permitted to be located adjacent to obstructions where the sprinkler is installed in the allowable obstruction zone as shown in Figure 8.2.5.1.5 and the closest edge of the obstruction is a minimum of 12 in. (300 mm) away from the centerline of the sprinkler.

Figure 8.2.5.1.5 Obstruction in Hallway — Pendent Sprinkler

8.2.5.2 Sidewall Sprinklers.

8.2.5.2.1 Sidewall sprinklers shall be located at least 5 ft (1.5 m) away from obstructions such as ceiling fans and light fixtures unless the requirements of 8.2.5.4 are met.

8.2.5.2.2 The distance shall be measured from the center of the sprinkler to the center of the obstruction.

8.2.5.2.3 Where the sprinkler cannot be located 5 ft (1.5 m) away from the obstruction (as measured to the center of the obstruction), an additional sprinkler shall be installed on the other side of the obstruction.

8.2.5.2.4 Where the area of the fan blades encompasses more than 50 percent of the area of the plan view, the sprinkler shall be installed in accordance with 8.2.5.4.

8.2.5.2.5 In hallways up to 6 ft (1.8 m) in width, sprinklers shall be permitted to be located adjacent to obstructions where the sprinkler is installed in the allowable obstruction zone as shown in Figure 8.2.5.2.5 and the closest edge of the obstruction is a minimum of 12 in. (300 mm) away from the deflector.

Figure 8.2.5.2.5 Obstruction in Hallway — Sidewall Sprinkler

8.2.5.3 Continuous Obstructions to Pendent Sprinklers.

8.2.5.3.1

Sprinklers shall be positioned with respect to continuous obstructions in accordance with 8.2.5.3.2, 8.2.5.3.3, or 8.2.5.3.4.

8.2.5.3.2 Sprinklers shall be positioned with respect to continuous obstructions in accordance with [Table 8.2.5.3.2](#) and [Figure 8.2.5.3.2](#).

Table 8.2.5.3.2

Figure 8.2.5.3.2 Positioning of Sprinkler to Avoid Obstruction to Discharge (Residential Upright and Pendent Spray Sprinklers).

8.2.5.3.3 Sprinklers shall be positioned with respect to an obstruction against a wall in accordance with [Figure 8.2.5.3.3\(a\)](#), [Figure 8.2.5.3.3\(b\)](#), or [Figure 8.2.5.3.3\(c\)](#).

Figure 8.2.5.3.3(a) Positioning of Sprinkler to Avoid Obstructions Against Walls — Scenario 1 (Residential Upright and Pendent Spray Sprinklers).

Figure 8.2.5.3.3(b) Positioning of Sprinkler to Avoid Obstructions Against Walls — Scenario 2 (Residential Upright and Pendent Spray Sprinklers).

Figure 8.2.5.3.3(c) Positioning of Sprinklers to Avoid Obstructions Against Walls — Scenario 3 (Residential Upright and Pendent Spray Sprinklers).

8.2.5.3.4 A sprinkler shall be installed on the other side of the obstruction.

8.2.5.4 Continuous Obstructions to Sidewall Sprinklers.

8.2.5.4.1 Sprinklers shall be positioned with respect to continuous obstructions in accordance with [8.2.5.4.2](#) or [8.2.5.4.3](#).

8.2.5.4.2 Sprinklers shall be positioned with respect to continuous obstructions in accordance with [Table 8.2.5.4.2\(a\)](#), [Figure 8.2.5.4.2\(a\)](#), [Table 8.2.5.4.2\(b\)](#), [Figure 8.2.5.4.2\(b\)](#), [Figure 8.2.5.4.2\(c\)](#), and [Figure 8.2.5.4.2\(d\)](#).

Table 8.2.5.4.2(a)

Figure 8.2.5.4.2(a) Positioning of Sprinkler to Avoid Obstruction (Residential Sidewall Sprinklers).

Figure 8.2.5.4.2(b) Positioning of Sprinkler to Avoid Obstruction Along Wall (Residential Sidewall Sprinklers).

Figure 8.2.5.4.2(c) Positioning of Sprinkler to Avoid Obstructions Against Walls — Scenario 1 (Residential Sidewall Sprinklers).

Figure 8.2.5.4.2(d) Positioning of Sprinkler to Avoid Obstructions Against Walls — Scenario 2 (Residential Sidewall Spray Sprinklers).

8.2.5.4.3

A sprinkler shall be installed on the other side of the obstruction.

8.2.5.5 Soffits and Cabinets.

Where soffits are used for the installation of sidewall sprinklers, the sprinklers and soffits shall be installed in accordance with [8.2.5.5.1](#), [8.2.5.5.2](#), or [8.2.5.5.3](#).

8.2.5.5.1

Where soffits exceed more than 8 in. (200 mm) in width or projection from the wall, sprinklers shall be installed under the soffit.

8.2.5.5.2

Sidewall sprinklers shall be permitted to be installed in the face of a soffit located directly over cabinets, without requiring additional sprinklers below the soffit or cabinets, where the soffit does not project horizontally more than 12 in. (300 mm) from the wall.

8.2.5.5.3

Where sidewall sprinklers are more than 3 ft (0.91 m) above the top of cabinets, the sprinkler shall be permitted to be installed on the wall above the cabinets where the cabinets are no greater than 12 in. (300 mm) from the wall.

8.2.5.6

Shadow areas in corridors up to 2 ft (0.61 m) in depth and up to 9 ft (2.7 m) in length behind sidewall sprinklers shall be permitted as shown in [Figure 8.2.5.6](#).

Figure 8.2.5.6 Shadow Areas Behind Sidewall Sprinklers in Corridors. [13R:Figure 6.4.6.3.3.2]

8.2.5.7* Shadow Areas.

Shadow areas shall be permitted in the protection area of a sprinkler as long as the cumulative dry areas do not exceed 15 ft² (1.4 m²) per sprinkler.

8.2.5.8 Small areas created by architectural features, such as planter box windows, bay windows, and similar features, shall be evaluated as follows:

- (1) Where no additional floor area is created by the architectural feature, no additional sprinkler protection is required.
- (2) Where additional floor area is created by an architectural feature, no additional sprinkler protection is required, provided all of the following conditions are met:
 - (a) The floor area shall not exceed 18 ft² (1.7 m²).
 - (b) The floor area shall not be greater than 24 in. (600 mm) in depth at the deepest point of the architectural feature to the plane of the primary wall where measured along the finished floor.
 - (c) The floor shall not be greater than 9 ft (2.7 m) in length where measured along the plane of the primary wall.
 - (d) Measurement from the deepest point of the architectural feature to the sprinkler shall not exceed the maximum listed spacing of the sprinkler.
- (3) The hydraulic design shall not be required to consider the area created by the architectural feature.

8.2.6* Exposed Barrel Lengths for Dry Sprinklers.

8.2.6.1 Where dry sprinklers are connected to wet pipe sprinkler systems protecting areas subject to freezing temperatures, the minimum exposed length of the barrel of the dry sprinkler shall be in accordance with [Table 8.2.6.1\(a\)](#) or [Table 8.2.6.1\(b\)](#).

Table 8.2.6.1(a)

Table 8.2.6.1(b)

8.2.6.2 The minimum barrel length shall be measured from the face of the fitting to which the dry sprinkler is installed to the inside surface of the insulation, wall, or ceiling leading to the cold space, whichever is closer to the fitting.

8.2.7 Closets and Compartments. In all closets and compartments that are smaller than 400 ft³ (11 m³), including those housing mechanical equipment, pendent, upright, and sidewall residential sprinklers shall be permitted to be installed in either of the following situations:

- (1) Within 18 in. (450 mm) of the ceiling to avoid obstructions near the ceiling where the compartment is enclosed by walls and a door
- (2) At the highest ceiling level without regard to obstructions or minimum distances to wall

Chapter 11 Installation of Piping, Valves, and Appurtenances

5.1.1* Only new sprinklers shall be installed in sprinkler systems.

5.1.1.1* Where a sprinkler is removed from a fitting or welded outlet, it shall not be reinstalled except as permitted by 5.1.1.1.1.

5.1.1.1.1 Dry sprinklers shall be permitted to be reinstalled when removed in accordance with the manufacturer's installation and maintenance instructions.

5.1.1.2 Spare sprinklers shall not be required to be provided.

7.7 Attics. When nonmetallic piping is installed in attics, adequate insulation shall be provided on the attic side of the piping to avoid exposure of the piping to temperatures in excess of the pipe's rated temperature.

7.1.1 A single control valve arranged to shut off both the domestic system and the sprinkler system shall be installed unless a separate shutoff valve for the sprinkler system is in-stalled in accordance with 7.1.2.

7.1.2 The sprinkler system piping shall not have separate control valves installed unless supervised by one of the following methods:

- (1) Central station, proprietary, or remote station alarm service
- (2) Local alarm service that causes the sounding of an audible signal at a constantly attended location
- (3) Valves that are locked open

7.1.3 A separate shutoff valve shall be installed for the domestic water supply in installations other than those complying with Section 6.3.

7.1.4 If provided, a backflow prevention assembly that includes a shutoff valve shall be considered a control valve, and an additional control valve shall not be required.

7.2 Drains and Test Connections.

7.2.1* Each sprinkler system shall have a minimum 1/2 in. (15 mm) drain on the system side of the control valve.

7.2.2 A valve shall be installed in the drain piping.

7.2.3 A drain shall be installed for each trapped portion of a dry system that is subject to freezing temperatures.

7.2.4* Where waterflow alarms are provided, test connections shall be installed at locations that allow flow testing of water supplies, connections, and alarm mechanisms.

7.2.5 The test connections, where provided, shall contain a K-factor equal to or smaller than the smallest sprinkler K-factor installed in the system.

7.2.6* Where a pressure-reducing or pressure-regulating valve is installed on a stand-alone system, a test connection with a K-factor at least as large as the smallest sprinkler K-factor on the system shall be installed downstream of the device.

7.3 Pressure Gauges.

7.3.1 Where a dry system is installed, a pressure gauge shall be installed to indicate system air pressure.

7.3.2 Where a pressure tank is used for the water supply, a pressure gauge shall be installed to indicate tank pressure.

7.3.3 Where a pressure-reducing or pressure-regulating valve is installed on a stand-alone system, a pressure gauge shall be installed downstream of the device.

7.8 Multipurpose and Passive Purge Systems.

7.8.1 Where common supply pipes serve both fire sprinkler and domestic uses, a point of connection shall be provided for the domestic connection.

7.8.2 Where the fire sprinkler system and the domestic system are separate, the point of connection shall be permitted to be at any location complying with Sections 6.2, 6.3, or 6.5.

7.8.3 For passive purge systems, the fire sprinkler system installer shall provide a minimum 1/2 in. (13 mm) NPT capped or plugged connection at the compartment where the passive purge fixture will be installed.

7.8.4 Other means and locations of connections shall be permitted when coordinated with the domestic installer and approved by the authority having jurisdiction.

Chapter 12 Installation Requirements for Hanging and Support of System Piping

7.4 Piping Support.

7.4.1 Listed pipe shall be supported in accordance with any listing limitations.

7.4.2 Pipe that is not listed, and listed pipe with listing limitations that do not include piping support requirements, shall be supported from structural members using support methods comparable to those required by applicable local plumbing codes.

7.4.3 Piping laid on open joists or rafters shall be supported in a manner that prevents lateral movement.

7.4.4* Sprinkler piping shall be supported in a manner that prevents the movement of piping upon sprinkler operation.

7.4.5* Where sprinkler piping is exposed to the sprinkler protected area, it shall be supported with metal hangers or hangers made of the same material as the structure.

Chapter 13 Design Approaches

8.1 Design Criteria.

8.1.1 Sloped Ceilings.

8.1.1.1 Where the ceiling is sloped, the maximum S dimension shall be measured along the slope of the ceiling to the next sprinkler or wall, as shown in Figure 8.1.1.1.

Figure 8.1.1.1 Measuring S Dimension.

8.1.1.2 The sprinklers shall maintain the minimum listed spacing, but no less than 8 ft (2.4 m), measured in the plan view from one sprinkler to another, as shown in Figure 8.1.1.1.

8.1.1.3 Where the ceiling is sloped, a sprinkler shall be installed within 36 in. (900 mm) vertically of the peak as shown in Figure 8.1.1.1 or in accordance with the manufacturer's listing.

8.1.2 Nonresidential Sprinklers.

Sprinklers other than residential sprinklers shall be installed in accordance with the coverage criteria specified by NFPA 13.

8.1.3 Sprinkler Coverage.

8.1.3.1 Residential Sprinklers.

8.1.3.1.1 Sprinklers shall be installed in accordance with their listing where the type of ceiling configuration is referenced in the listing.

8.1.3.1.2* Where construction features or other special conditions exist that are outside the scope of sprinkler listings, listed sprinklers shall be permitted to be installed beyond their listing limitations.



8.1.3.1.3 Where a physical barrier exists between the sprinklers that prevents each sprinkler from directly spraying on the other, there shall be no minimum distance between sprinklers.

8.1.4 Operating Pressure.

The minimum operating pressure of any sprinkler shall be the higher of the minimum operating pressure specified by the listing or 7 psi (0.5 bar).

Chapter 14 Special Occupancy

5.4 Pre-Engineered Systems.

Where listed pre-engineered systems are installed, they shall be installed within the limitations that have been established by the testing laboratories.

8.3.10 Tiny House(s).

8.3.10.1 For dwellings 400 ft² (37 m²) or less in floor area, excluding lofts, residential sprinklers shall be installed in accordance with the manufacturer's listed spacing without regard to obstructions.

8.3.10.2 The floor area under structural horizontal obstructions greater than 4 ft (1200 mm) in width shall be protected.

8.3.10.3 Sprinkler positioning in accordance with Section 8.2 shall not be required.

Chapter 15 Plans and Calculations

10.1 Design Discharge.

10.1.1* Sprinklers That Are Listed with Specific Discharge Criteria.

The system shall provide at least the flow required to produce a minimum discharge density of 0.05 gpm/ft² (2.0 mm/min) or the sprinkler listing, whichever is greater, to the design sprinklers.

10.1.2 Water Supply. Where the water supply is a public or private water main 4 in. (100 mm) (nominal) in size or larger, the static pressure shall be permitted to be used for comparison to the sprinkler system demand regardless of the method used to determine the adequacy of the piping.

10.2* Number of Design Sprinklers.

10.2.1 For each of the following situations, the number of sprinklers in the design area shall be all of the sprinklers within a compartment, up to a maximum of two sprinklers, that require the greatest hydraulic demand:

(1) A flat, smooth, horizontal ceiling with no beams up to a maximum of 24 ft (7.3 m) above the floor.

(2) A flat, horizontal beamed ceiling, with a maximum ceiling height of 24 ft (7.3 m), with beams up to 14 in. (350 mm) deep with pendent sprinklers under the beams. The compartment containing the beamed ceiling shall be a maximum of 600 ft² (56 m²) in area. The highest sprinkler in the compartment shall be above all openings from the compartment into any communicating spaces.

(3) A smooth, flat, sloped ceiling with no beams up to a maximum slope of 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(4) A sloped ceiling with beams up to 14 in. (350 mm) deep with pendent sprinklers under the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft² (56 m²) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(5) A sloped ceiling with beams of any depth with sidewall or pendent sprinklers in each pocket formed by the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft² (56 m²) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor.

10.2.2 Listed flows associated with testing under a smooth, flat, horizontal 8 ft (2.4 m) high ceiling shall be permitted to be used for the ceiling configurations referenced in 10.2.1.

10.2.3 For situations not meeting one of the conditions in 10.2.1, residential sprinklers listed for use in specific ceiling configurations shall be permitted to be used in accordance with their listing.

10.2.4* For situations not meeting one of the conditions in 10.2.1 and 10.2.3, the number of sprinklers in the design area shall be determined in consultation with the authority having jurisdiction as appropriate for the conditions.

10.3 Piping Configurations.

10.3.1 The piping configuration shall be permitted to be looped.

10.3.2 The piping configuration shall be permitted to be gridded except where gridded systems are prohibited by Chapter 9.

10.3.3 The piping configuration shall be permitted to be straight run.

10.3.4 The piping configuration shall be permitted to be a combination of the configurations permitted in 10.3.1 through 10.3.3.

10.4 Pipe Sizing.

10.4.1 For specially listed piping products, friction loss for pipe and fittings shall be permitted to be calculated based on the manufacturer's data.

10.4.2 Minimum Pipe Size.

10.4.2.1 The minimum size of steel pipe shall be 1 in. (25 mm).

10.4.2.2 The minimum size of pipe other than steel pipe shall be 3/4 in. (20 mm) unless smaller sizes are permitted by 10.4.2.3.

10.4.2.3* Along with listed special fittings, 1/2 in. (15 mm) nonmetallic pipe and 1/2 in. (15 mm) copper pipe shall be permitted to be used only in network systems under the following conditions:

(1)* Each sprinkler shall be supplied through a minimum of three separate paths from the supply manifold.

(2) Calculations shall clearly indicate the pipes that create the paths to each sprinkler.

(3) A water distribution pipe that supplies a sprinkler shall not terminate in a dead end.

(4) Hydraulic calculations shall be prepared for each sprinkler flowing individually within the system and for each pair of sprinklers within the same compartment.

(5) The location of the most demanding single sprinkler and pair of sprinklers, including their pressure and flow requirements, shall be indicated on the plan review documents.

(6) The system shall be hydraulically calculated in accordance with the provisions of NFPA 13, except that the friction loss straight through a fitting shall be included.

(7) The method of joining the pipe to fittings or to other pipe shall be in accordance with the applicable plumbing code.

(8) A maximum of one insert tee shall be permitted in each pipe section between sprinklers to serve only domestic fixtures.

(9) When insert fittings are installed, each sprinkler shall have four separate paths from the water supply.

(10) The piping supplying only plumbing fixtures shall be in accordance with the applicable plumbing code.

10.4.3

The pipes shall be sized using one of the following techniques:

(1) The simplified calculation method of 10.4.4, which can only be used for connections to a city water main of at least 4 in. (100 mm) in diameter

(2) The prescriptive pipe sizing method of 10.4.9

(3) The hydraulic calculation procedure for NFPA 13

(4) The manufacturer's listed installation instructions

10.4.4* General Pipe Sizing Method. The following is the general pipe sizing method for straight-run systems connected to a city water main of at least 4 in. (100 mm) in diameter in accordance with 10.4.3(1):

(1) The system flow rate shall be established in accordance with Sections 10.1 and 10.2, and it shall be determined that the flow allowed by the water meter meets or exceeds the system demand and that the total demand flow does not exceed the maximum flow allowed by the piping system components.

(2) The water pressure in the street shall be determined.

(3) Pipe sizes shall be selected.

(4)* Pressure loss for a water meter, if any, shall be determined and deducted using one of the following:

(a) Table 10.4.4(a) shall be permitted to be used, even where the sprinkler demand flow exceeds the meter's rated continuous flow.

(b) Higher pressure losses specified by the manufacturer shall be used in place of those specified in Table 10.4.4(a).

(c) Lower pressure losses shall be permitted to be used where supporting data are provided by the meter manufacturer.

(5) Pressure loss for elevation shall be deducted as follows:

(a) Building height above street (ft) $\times$ 0.433 = pressure loss (psi)

(b) Building height above street (m) $\times$ 0.098 = pressure loss (bar)

(6)* Pressure losses from the city main to the inside control valve shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).

(7) Pressure loss for piping within the building shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).

(8) Pressure loss for valves and fittings shall be deducted as follows:

(a) The valves and fittings from the control valve to the farthest sprinkler shall be counted.

(b) The equivalent length for each valve and fitting as shown in Table 10.4.4(b), Table 10.4.4(c), Table 10.4.4(d), Table 10.4.4(e), or as specified by the manufacturer shall be determined and the values added to obtain the total equivalent length for each pipe size.

(c) The equivalent length for each size shall be multiplied by the pressure loss associated with the pipe material and the values totaled.

(9) In multilevel buildings, the steps in 10.4.4(1) through 10.4.4(8) shall be repeated to size piping for each floor.

(10) If the remaining pressure is less than the operating pressure established by the testing laboratory for the sprinkler being used, the sprinkler system shall be redesigned.

(11) If the remaining pressure is higher than required, smaller piping shall be permitted to be used where justified by calculations.

(12) The remaining piping shall be sized the same as the piping up to and including the farthest sprinkler unless smaller pipe sizes are justified by calculations.

Table 10.4.4(a) Pressure Losses in psi in Water Meters

Table 10.4.4(b) Equivalent Length in Feet of Fittings and Valves for Schedule 40 Steel Pipe

Table 10.4.4(c) Equivalent Length in Feet of Fittings and Valves for Type K Copper Tube

Table 10.4.4(d) Equivalent Length in Feet of Fittings and Valves for Type L Copper Tube

Table 10.4.4(e) Equivalent Length in Feet of Fittings and Valves for Type M Copper Tube

10.4.5 To size piping for systems with an elevated tank, pump, or pump-tank combination, the pressure at the water supply outlet shall be determined and the steps in 10.4.4(3), 10.4.4(4), 10.4.4(7), 10.4.4(8), 10.4.4(9), 10.4.4(10), and 10.4.4(11) shall be followed.

10.4.6 Hydraulic calculation procedures in accordance with NFPA 13 shall be used for grid-type systems.

10.4.6.1 Where the water supply is a public or private water main 4 in. (100 mm) nominal in size or larger, only the static pressure measured at the main shall be required for performing hydraulic calculations.

10.4.7 Hydraulic calculation procedures in accordance with NFPA 13 shall be used for looped-type systems.

10.4.7.1 Where the water supply is a public or private water main 4 in. (100 mm) nominal in size or larger, only the static pressure measured at the main shall be required for performing hydraulic calculations.

10.4.8 Hydraulic calculation procedures in accordance with NFPA 13 shall be used for systems connected to city water mains of less than 4 in. (100 mm) in diameter.

10.4.9 Prescriptive Pipe Sizing Method. Pipe shall be sized by determining the available pressure to offset friction loss in piping and identifying a piping material, diameter, and length using the equation in 10.4.9.1 and the procedure in 10.4.9.2.

10.4.9.1 Available Pressure Equation. The pressure available to offset friction loss in the interior piping system (P_t) shall be determined in accordance with the following formula:

[10.4.9.1]

10.4.9.2 Calculation Procedure.

Determination of the required size for water distribution piping shall be in accordance with the following procedure:

(1) Step 1 — Determine P_{sup} . Obtain the static supply pressure that will be available from the water main from the water purveyor or from a private source, such as a tank system, a private well system, or a combination of these. For a private source, the available water supply pressure shall be based on the minimum pressure control setting for the pump.

(2) Step 2 — Determine PL_{svc} . Use Table 10.4.9.2(a) to determine the pressure loss in the water service pipe based on the selected size of the water service.

(3) Step 3 — Determine PL_m. Use Table 10.4.4(a) to determine the pressure loss from the water meter based on the selected water meter size. Where the actual water meter pressure loss is known, PL_m shall be the actual loss.

(4) Step 4 — Determine PL_d. Determine the pressure loss from devices, other than the water meter, installed in the piping system supplying sprinklers, such as pressure-reducing valves, backflow preventers, water softeners, or water filters, taking into account the following:

(a) Device pressure losses shall be based on the device manufacturer's specifications.

(b) The flow rate used to determine pressure loss shall be the rate from Section 10.1, except that 5 gpm (20 L/min) shall be added where the device is installed in a water service pipe that supplies more than one dwelling.

(c) As an alternative to deducting pressure loss for a device, an automatic bypass valve shall be installed to divert flow around the device when a sprinkler activates.

(5) Step 5 — Determine PL_e. Use Table 10.4.9.2(b) to determine the pressure loss associated with changes in elevation. The elevation used in applying the table shall be the difference between the elevation where the water source pressure was measured and the elevation of the highest sprinkler.

(6) Step 6 — Determine PL_{sp}. Determine the maximum pressure required by any individual sprinkler based on the following:

(a) The area of coverage

(b) The ceiling configuration

(c) The temperature rating

(d) *Any additional conditions specified by the sprinkler manufacturer

(7) Step 7 — Calculate PL_t. Using the equation in 10.4.9.1, calculate the pressure available to offset friction loss in water distribution piping between the service valve and the sprinklers.

(8) Step 8 — Determine the maximum allowable pipe length. Use Table 10.4.9.2(c) through Table 10.4.9.2(h) to select a material and size for water distribution piping. The piping material and size shall be acceptable if the developed length of pipe between the service valve and the most remote sprinkler does not exceed the maximum allowable length specified by the applicable table. Interpolation of P_t between the tabular values shall be permitted.

Table 10.4.9.2(a) Water Service Pressure Loss (PL_{svc})

Table 10.4.9.2(b) Elevation Loss (PL_e)

Table 10.4.9.2(c) Allowable Pipe Length for 3/4 in. Type M Copper Water Tubing

Table 10.4.9.2(d) Allowable Pipe Length for 1 in. Type M Copper Water Tubing

Table 10.4.9.2(e) Allowable Pipe Length for 3/4 in. CPVC (IPS) Pipe

Table 10.4.9.2(f) Allowable Pipe Length for 1 in. CPVC (IPS) Pipe

Table 10.4.9.2(g) Allowable Pipe Length for 3/4 in. PEX Tubing

Table 10.4.9.2(h) Allowable Pipe Length for 1 in. PEX Tubing

10.4.9.3 The maximum allowable length of piping in Table 10.4.9.2(c) through Table 10.4.9.2(h) incorporates an adjustment for pipe fittings, and no additional consideration of friction losses associated with pipe fittings shall be required.

Chapter 16 Systems Acceptance

11.1 General.

11.1.1 The installer shall perform all required acceptance tests prior to asking for approval of the installation.

11.1.2 When the authority having jurisdiction is required to be present during the acceptance tests, the installer shall coordinate the time and date of testing with the authority having jurisdiction and other interested parties.

11.2 Acceptance Tests.

11.2.1* Hydrostatic Tests.

11.2.1.1 Where a fire department pumper connection is not provided, the system shall be hydrostatically tested at normal system operating pressure without evidence of leakage.

11.2.1.2 Where a fire department pumper connection is provided, the system shall pass a hydrostatic pressure test performed in accordance with NFPA 13.

11.2.1.3 Evidence of leakage shall be determined by a drop in pressure at a gauge over a period of 2 hours or by visually checking the piping system for leakage.

11.2.1.4 When systems are being hydrostatically tested, the test shall be permitted to be conducted with sprinklers or plugs installed in the fittings.

11.2.1.4.1 Any plugs used during the hydrostatic testing shall be replaced with sprinklers after the test is completed.

11.2.1.4.2 No additional hydrostatic testing shall be required after the sprinklers are installed.

11.2.2* Pump Tests.

11.2.2.1 Prior to system acceptance, a system utilizing a pump shall be tested by opening the drain/test connection.

11.2.2.1.1* The pump shall sense the flow, turn on, and flow water for the required duration of 6.1.2 or 6.1.3 without interruption.

11.2.3 System Operational Tests.

11.2.3.1 Waterflow Devices. Where waterflow detection devices are installed, these devices, including the associated alarm circuits, shall be flow tested through the inspector's test connection and shall result in an audible alarm on the premises.

11.2.3.2 Preaction Systems. The operation of the preaction system shall be tested in accordance with the manufacturer's instructions.

11.2.3.3 Dry Pipe and Double-Interlock Preaction Systems. A test shall be conducted in accordance with the valve manufacturer's instructions to measure the time to trip the valve and the time for water to be discharged from the inspector's test connection.

11.2.3.3.1 All times shall be measured from the time the inspector's test connection is completely open.

Chapter 17 Existing System Modifications

12.3.6 Inactive Systems.

12.3.6.1* In a detached dwelling or a manufactured home, the sprinkler system shall be permitted to be put in an inactive state for any of the following reasons:

(1) After a manufactured home has been installed and tested in the factory and is being prepared for shipment

(2) When a manufactured home is being stored for future occupancy

(3) When the detached dwelling is unoccupied during renovation work

(4) When the detached dwelling is unoccupied for an extended period of time

12.3.6.2 Where a wet pipe system is installed and the piping will be subject to freezing, the piping and the stored water supply shall be drained.

12.3.6.2.1* Where residential pendent and sidewall sprinklers are installed on drops that are 4 in. (100 mm) or less in length, the drops shall not be required to be drained.

12.3.6.3 The systems shall be placed back in service prior to occupancy.

12.3.6.4 Prior to the system being restored to service, the system shall be filled with water, pressurized to normal system pressure, and visually inspected for leaks.

12.3.6.5 Once the system has been restored to service, it shall be inspected and tested in accordance with Section 12.2.

Chapter 18 System Inspection, Testing, and Maintenance

12.1* General. The installer shall provide to the owner/occupant instructions on inspecting, testing, and maintaining the system.

12.2* Inspections and Tests. The sprinkler system shall be inspected and tested periodically to make sure the system is in good working condition.

12.3 Maintenance.

12.3.1 The sprinkler system shall be properly maintained in accordance with this standard and the manufacturers' instructions.

12.3.2 Any sprinkler that is operated, damaged, corroded, covered with foreign materials, or showing signs of leakage shall be replaced with a new listed sprinkler having the same performance characteristics as the original equipment.

12.3.2.1* Where replacing residential sprinklers manufactured prior to 2003 that are no longer available from the manufacturer and are installed using a design density less than 0.05 gpm/ft² (2.04 mm/min), a residential sprinkler with an equivalent K-factor (± 5 percent) shall be permitted to be used provided the currently listed coverage area for the replacement sprinkler is not exceeded.

 12.3.3 Painting Sprinklers.

12.3.3.1 Sprinklers shall not be painted unless applied by the manufacturer.

12.3.3.2*

Any sprinklers that have been painted outside of the factory shall be replaced with a new listed sprinkler.

 12.3.4* Wet Pipe Systems.

A wet pipe system shall be maintained above 40°F (4°C), including areas properly insulated to maintain 40°F (4°C).

12.3.5* Antifreeze Systems.

12.3.5.1 Annual Antifreeze Solution Test and Replacement Procedure.

12.3.5.1.1

Samples of antifreeze solution shall be collected by qualified individuals in accordance with 12.3.5.1.1.2 or 12.3.5.1.1.3 on an annual basis.

12.3.5.1.1.1

The system shall be drained to verify the following:

(1) The solution is in compliance with 9.2.2.1.1.

(2) The solution provides the necessary freeze protection.

12.3.5.1.1.2 Solution samples shall be taken near the beginning and near the end of the draining process.

12.3.5.1.1.3* Solution samples shall be taken at the highest practical elevation and the lowest practical elevation of the system.

12.3.5.1.2 The two samples collected in accordance with the procedures specified in 12.3.5.1.1.2 or 12.3.5.1.1.3 shall be tested to verify that the specific gravity of both samples is similar and that the solution is in compliance with 9.2.2.1.1.

12.3.5.1.2.1 The specific gravity of each solution shall be checked using a hydrometer with a suitable scale or a refractometer having a scale calibrated for the antifreeze solution.

12.3.5.1.3* If concentrations of the two samples collected in accordance with the procedures in 12.3.5.1.1.2 or 12.3.5.1.1.3 are similar and in compliance with 9.2.2.1.1, then (a) the solution drained in accordance with 12.3.5.1.1.1 can be used to refill the system, or (b) the existing undrained solution tested in accordance with 12.3.5.1.1.3 shall be permitted to continue to be used.

12.3.5.1.3.1 If the two samples are not similar and not in compliance with 9.2.2.1.1, then a solution in compliance with 9.2.2.1.1 shall be used to refill the system.

12.3.5.1.4 Tag.

12.3.5.1.4.1 A tag shall be attached to the riser indicating the date the antifreeze solution was tested.

12.3.5.1.4.2 The tag shall also indicate the type and concentration of antifreeze solution (by volume) with which the system is filled, the date the antifreeze was replaced (if applicable), the name of the contractor that tested and/or replaced the antifreeze solution, the contractor's license number, a statement indicating if the entire system was drained and replaced with antifreeze, and a warning to test the concentration of the antifreeze solutions at yearly intervals per this standard.

Annex



Public Input No. 18-NFPA 13D-2025 [Section No. 1.1.1]

1.1.1

This standard shall cover the design, installation, and maintenance of automatic sprinkler systems for protection against the fire hazards in ~~one- and two-family dwellings,~~ manufactured homes, ~~and townhouses~~ townhouses, and residential structures that contain no more than four dwelling units .

Statement of Problem and Substantiation for Public Input

There has been a movement to include up to four dwelling units to be built in accordance with the residential building code. The effectiveness of NFPA 13D sprinkler protection in dwelling units has been exemplary. The protection offered by these types of systems is reasonable for very small buildings up to a total of four dwelling units.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 20-NFPA 13D-2025 [Section No. 6.2.3]</u>	

Submitter Information Verification

Submitter Full Name: Peter Schwab
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City:
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Submittal Date: Mon May 26 14:46:02 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: The NFPA 13D standard is currently written to cover one- and two-family dwellings. Currently, depending on how triplexes and quads are built, they can be protected under NFPA 13D. An example is townhouses with firewalls separating the units.



Public Input No. 10-NFPA 13D-2025 [Section No. 1.5.3]

1.5.3

These units with conversion factors shall be used as listed in Table 1.5.3.

Replace Table 1.5.

3 Metric

3 with a revised version.

See Attached Word Document.

Table 1.5.3 Metric Conversion Factors

	<u>Name of Unit</u>	<u>Unit Symbol</u>	<u>Conversion Factor</u>
<u>Length</u>	<u>Millimeter</u>	<u>mm</u>	<u>1 in. =</u>
	<u>25 mm</u>		
	<u>25.4 mm</u>		
	<u>Meter</u>	<u>m</u>	<u>1 ft = 0.3048 m</u>
<u>Area</u>	<u>Square millimeter</u>	<u>mm²</u>	<u>1 in.² = 645.2 mm²</u>
	<u>Square meter</u>	<u>m²</u>	<u>1 ft² = 0.0929 m²</u>
<u>Volume</u>	<u>Cubic millimeter</u>	<u>mm³</u>	<u>1 in.³ = 16.387 mm³</u>
	<u>Cubic meter</u>	<u>m³</u>	<u>1 ft³ = 0.02832 m³</u>
<u>Fluid capacity</u>	<u>Liter</u>	<u>L</u>	<u>1 fl oz = 0.02957 L</u>
	<u>Liter</u>	<u>L</u>	<u>1 gal = 3.785 L</u>
<u>Flow</u>	<u>Liter per minute</u>	<u>L/min</u>	<u>1 gpm = 3.7848 L/min</u>
<u>Pressure</u>	<u>Bar</u>	<u>bar</u>	<u>1 psi = 0.0689 bar</u>
<u>Discharge density</u>	<u>Millimeter/minute</u>	<u>mm/min</u>	<u>1 gpm/ft² = 40.746 mm/min</u>
	<u>Liter/minute/m²</u>		
	<u>L/min/m²</u>		
	<u>1 gpm/ft² = 40.746 (L/min)/m²</u>		
<u>K-factor</u>	<u>K-factor</u>		<u>L/min/(bar)</u>

$\frac{1}{2}$ 1.gpm/(psi)

2

$\frac{1}{2}$ =

-

14.285 L/min/(bar)

2

) $\frac{1}{2}$ -

Weight Kilogram kg 1 lb = 0.4536 kg

Density Kilogram/cubic meter kg/m³ 1 lb/ft³ = 16.02 kg/m³

Temperature Fahrenheit °F F° = 9/5 × C° + 32

-

Celsius °C C° = 5/9 (F° - 32)

Velocity Kilometer per hour km/h 1 mph = 1.609 km/h

-

Meter s per second m/sec 1 fps = 0.3048 m/sec

Pound force Newton N 1 lb force = 4.44822 N

Stress Kilonewton per square meter kN/m² 1 lbf/ft² = 0.047880
kN/m² - Megapascal MPa 1 lbf/in.² = 0.006895 MPa Gauge (sheet
steel) Millimeter mm 12 gauge = 2.8 mm -- 14 gauge = 1.98 mm -- 16 gauge =
1.57 mm -- 22 gauge = 0.78 mm --- 24 gauge = 0.63 mm

Note: For additional conversions and information, see ASTM SI 10, ~~IEEE/ASTM SI~~
~~10 American National Standard for Metric Practice~~ -

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_13D_Table_1.5.3.docx	Revisions to Table 1.5.3	

Statement of Problem and Substantiation for Public Input

This proposal is offered to revise the table to correct some units of measurement and to delete units that are not used in NFPA 13D.

The conversion for Length in millimeters is revised to 1 in. = 25.4 mm, to be precise, to coordinate with the rest of the conversions shown in the table.

The conversion for K-factor is being editorially corrected. The psi and the bars values should be raised to the power of the "1/2" not to the "2". Reference Table A.9.2.2.2 and NFPA 13, Table 7.2.2.1.

Table 1.5.3 appears to have been copied directly from NFPA 13. However, there are units of measure

in the table that are not used in NFPA 13D: square inches (in.²), cubic inches (in.³), fluid ounces (oz), pound force (lbf) and stress (lbf/ft²). Therefore, metric conversions are not needed for these items. Additionally, the metric conversions for sheet steel gauge values are reported incorrectly. Editorial corrections to 2 decimal points are recommended. See attached Word **File**.

Submitter Information Verification

Submitter Full Name: Larry Keeping

Organization: PLC Fire Safety Engineering

Street Address:

City:

State:

Zip:

Submittal Date: Fri Apr 25 15:12:48 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: [FR-2-NFPA 13D-2025](#)

Statement: This corrects the metric conversions for millimeter to inches and corrects the K-factor conversion for metric-use. It also deletes conversion factors that are not used. Nominal dimensions, in parentheses, are still maintained. This should be considered for review by the AUT-AAC committee for consistency.

Table 1.5.3 Metric Conversion Factors

	Name of Unit	Unit Symbol	Conversion Factor
Length	Millimeter	mm	1 in. = 25.4 mm
	Meter	m	1 ft = 0.3048 m
Area	~~Square millimeter~~	~~mm²~~	~~1 in.² = 645.2 mm²~~
	Square meter	m ²	1 ft ² = 0.0929 m ²
Volume	~~Cubic millimeter~~	~~mm³~~	~~1 in.³ = 16,387 mm³~~
	Cubic meter	m ³	1 ft ³ = 0.02832 m ³
Fluid capacity	~~Liter~~	~~L~~	~~1 fl oz = 0.02957 L~~
	Liter	L	1 gal = 3.785 L
Flow	Liter per minute	L/min	1 gpm = 3.7848 L/min
Pressure	Bar	bar	1 psi = 0.0689 bar
Discharge density	Millimeter/minute	mm/min	1 gpm/ft ² = 40.746 mm/min
	~~Liter/minute/m²~~	~~L/min/m²~~	~~1 gpm/ft² = 40.746 (L/min)/m²~~
K-factor	K-factor	L/min/(bar) ^½	1 gpm/(psi) ^½ = 14.285 L/min/(bar) ²
Weight	Kilogram	kg	1 lb = 0.4536 kg
Density	Kilogram/cubic meter	kg/m ³	1 lb/ft ³ = 16.02 kg/m ³
Temperature	Fahrenheit	°F	F° = 9/5 × C° + 32
	Celsius	°C	C° = 5/9 (F° – 32)
Velocity	Kilometer per hour	km/h	1 mph = 1.609 km/h
	Meters per second	m/sec	1 fps = 0.3048 m/sec
~~Pound force~~	~~Newton~~	~~N~~	~~1 lb force = 4.44822 N~~
Stress	~~Kilonewton per square meter~~	~~kN/m²~~	~~1 lbf/ft² = 0.047880 kN/m²~~
	~~Megapascal~~	~~MPa~~	~~1 lbf/in.² = 0.006895 MPa~~
Gauge (sheet steel)	Millimeter	mm	12 gauge = <u>7/64 in.</u> = 2.78 mm
			14 gauge = <u>5/64 in.</u> = 1.98 mm
			16 gauge = <u>1/16 in.</u> = 1.59 mm
			22 gauge = <u>1/32 in.</u> = 0.79 mm
			24 gauge = <u>1/40 in.</u> = 0.64 mm

Note: For additional conversions and information, see ASTM SI 10, *IEEE/ASTM SI 10 American National Standard for Metric Practice*.



Public Input No. 5-NFPA 13D-2025 [Section No. 1.5.3]

1.5.3

These units with conversion factors shall be used as listed in Table 1.5.3.

Table 1.5.3 Metric Conversion Factors

~~millimeter - millimeter 24 gauge = 0.63 mm~~

		<u>Name of Unit</u>	<u>Unit Symbol</u>	<u>Conversion Factor</u>
Length	Millimeter	mm	1 in. = ~~25 mm~~ <u>25.4 mm</u>	
	-	Meter	m	1 ft = 0.3048 m
Area				
	<u>Square</u>			
~~mm²~~	~~1 in.² =~~			
	~~645.2 mm²~~			
-	Square meter	m ²	1 ft ² = 0.0929 m ²	
Volume				
	<u>Cubic</u>			
~~mm³~~	~~1 in.³ =~~			
	~~16,387 mm³~~			
-	Cubic meter	m ³	1 ft ³ = 0.02832 m ³	
Fluid capacity				
	<u>Liter</u>	<u>L</u>		
~~1 fl oz = 0.02957 L~~				
-	Liter	L	1 gal = 3.785 L	
Flow	Liter per minute	L/min	1 gpm = 3.7848 L/min	
Pressure	Bar	bar	1 psi = 0.0689 bar	
Discharge density	Millimeter/minute	mm/min	1 gpm/ft ² = 40.746 mm/min	
	-	~~(L/min)/m²~~	~~1 gpm/ft² = 40.746 (L/min)/m²~~	
K-factor	K-factor	L/min/(bar) ^{2 1/2}	1 gpm/(psi) ^{2 - 1/2} =	
			14.285 L/min/(bar) ^{2 1/2}	
Weight	Kilogram	kg	1 lb = 0.4536 kg	
Density	Kilogram/cubic meter	kg/m ³	1 lb/ft ³ = 16.02 kg/m ³	
Temperature	Fahrenheit	°F	F° = 9/5 × C° + 32	
	-	Celsius	°C	C° = 5/9 (F° - 32)
Velocity	Kilometer per hour	km/h	1 mph = 1.609 km/h	
	-	Meter per second	m/sec	1 fps = 0.3048 m/sec
Pound force	Newton	N	1 lb force = 4.44822 N	
Stress	Kilonewton per square meter	kN/m ²	1 lbf/ft ² = 0.047880 kN/m ²	
	-	Megapascal	1 lbf/in. ² = 0.006895 MPa	

		<u>Name of Unit</u>	<u>Unit Symbol</u>	<u>Conversion Factor</u>
Gauge (sheet steel)	Millimeter	mm	12 gauge = 2.8 mm	
-	-	-	14 gauge = 1.98 mm	
-	-	-	16 gauge = 1.57 mm	
-	-	-	22 gauge = 0.78 mm	
-	-	-		
Gauge (sheet steel)	Millimeter	mm	12 gauge = $\frac{7}{64}$ in. = 2.78 mm	
			14 gauge = $\frac{5}{64}$ in. = 1.98 mm	
			16 gauge = $\frac{1}{16}$ in. = 1.59 mm	
			22 gauge = $\frac{1}{32}$ in. = 0.79 mm	
			24 gauge = $\frac{1}{40}$ in. = 0.64 mm	

Note: For additional conversions and information, see ASTM SI 10, *IEEE/ASTM SI 10 American National Standard for Metric Practice*.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_13D_Table_1.5.3.docx	Proposed Revisions to NFPA 13D Table 1.5.3	

Statement of Problem and Substantiation for Public Input

The conversion for Length in millimeters is revised to 1 in. = 25.4 mm, to be precise, to coordinate with the rest of the conversions shown in the table.

The conversion for K-factor is being editorially corrected. The psi and the bars values should be raised to the power of the “½” not to the “2”. Reference Table A.9.2.2.2 and NFPA 13, Table 7.2.2.1.

Table 1.5.3 appears to have been copied directly from NFPA 13. However, there are units of measure in the table that are not used in NFPA 13D: square inches (in.²), cubic inches (in.³), fluid ounces (oz), pound force (lbf) and stress (lbf/ft²). Therefore, metric conversions are not needed for these items. Additionally, the metric conversions for sheet steel gauge values are reported incorrectly. Editorial corrections to 2 decimal points are recommended.

See attached Word File.

Submitter Information Verification

Submitter Full Name: Larry Keeping
Organization: PLC Fire Safety Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Mon Feb 24 19:04:11 EST 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-2-NFPA 13D-2025

Statement: This corrects the metric conversions for millimeter to inches and corrects the K-factor conversion for metric-use. It also deletes conversion factors that are not used. Nominal dimensions, in parentheses, are still maintained. This should be considered for review by the AUT-AAC committee for consistency.

Table 1.5.3 Metric Conversion Factors

	Name of Unit	Unit Symbol	Conversion Factor
Length	Millimeter	mm	1 in. = 25.4 mm
	Meter	m	1 ft = 0.3048 m
Area	~~Square millimeter~~	~~mm²~~	~~1 in.² = 645.2 mm²~~
	Square meter	m ²	1 ft ² = 0.0929 m ²
Volume	~~Cubic millimeter~~	~~mm³~~	~~1 in.³ = 16,387 mm³~~
	Cubic meter	m ³	1 ft ³ = 0.02832 m ³
Fluid capacity	~~Liter~~	~~L~~	~~1 fl oz = 0.02957 L~~
	Liter	L	1 gal = 3.785 L
Flow	Liter per minute	L/min	1 gpm = 3.7848 L/min
Pressure	Bar	bar	1 psi = 0.0689 bar
Discharge density	Millimeter/minute	mm/min	1 gpm/ft ² = 40.746 mm/min
	~~Liter/minute/m²~~	~~L/min/m²~~	~~1 gpm/ft² = 40.746 (L/min)/m²~~
K-factor	K-factor	L/min/(bar) ^{1/2}	1 gpm/(psi) ^{1/2} = 14.285 L/min/(bar) ^{1/2}
Weight	Kilogram	kg	1 lb = 0.4536 kg
Density	Kilogram/cubic meter	kg/m ³	1 lb/ft ³ = 16.02 kg/m ³
Temperature	Fahrenheit	°F	F° = 9/5 × C° + 32
	Celsius	°C	C° = 5/9 (F° – 32)
Velocity	Kilometer per hour	km/h	1 mph = 1.609 km/h
	Meters per second	m/sec	1 fps = 0.3048 m/sec
~~Pound force~~	~~Newton~~	~~N~~	~~1 lb force = 4.44822 N~~
~~Stress~~	~~Kilonewton per square meter~~	~~kN/m²~~	~~1 lbf/ft² = 0.047880 kN/m²~~
	~~Megapascal~~	~~MPa~~	~~1 lbf/in.² = 0.006895 MPa~~
Gauge (sheet steel)	Millimeter	mm	12 gauge = 7/64 in. = 2.78 mm
			14 gauge = 5/64 in. = 1.98 mm
			16 gauge = 1/16 in. = 1.59 mm
			22 gauge = 1/32 in. = 0.79 mm
			24 gauge = 1/40 in. = 0.64 mm

Note: For additional conversions and information, see ASTM SI 10, *IEEE/ASTM SI 10 American National Standard for Metric Practice*.



Public Input No. 41-NFPA 13D-2025 [Section No. 2.3.2]

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A53/A53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*, 2022.

ASTM A135/A135M, *Standard Specification for Electric-Resistance-Welded Steel Pipe*, 2021.

ASTM A234/A234M, *Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service*, 2023.

ASTM A795/A795M, *Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use*, 2021.

ASTM B32, *Standard Specification for Solder Metal*, 2020.

ASTM B43, *Standard Specification for Seamless Red Brass Pipe, Standard Sizes*, 2020.

ASTM B75/B75M, *Standard Specification for Seamless Copper Tube*, 2020.

ASTM B88, *Standard Specification for Seamless Copper Water Tube*, 2022.

ASTM B251/B251M, *Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube*, 2017.

ASTM B813, *Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper-Alloy Tube*, 2016.

ASTM B828, *Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings*, 2016.

ASTM F437, *Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*, 2021.

ASTM F438, *Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40*, 2017.

ASTM F439, *Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*, 2019.

ASTM F442/F442M, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)*, 2020.

ASTM F876, *Standard Specification for Crosslinked Polyethylene (PEX) Tubing*, 2022.

ASTM F1960, *Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing*, 2024

ASTM SI 10, *IEEE/ASTM SI 10 American National Standard for Metric Practice*, 2016.

Statement of Problem and Substantiation for Public Input

This public input is related to No. 40 and will be required if No. 40 is approved. See Public Input No. 40 for further substantiation.

Related Public Inputs for This Document

Related Input

Relationship

Public Input No. 40-NFPA 13D-2025 [New Section after 5.2.9.2]

Submitter Information Verification

Submitter Full Name: David Nickelson
Organization: Uponor
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 03 11:44:32 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-30-NFPA 13D-2025

Statement: References updated per the NFPA reference and extract policy. ASTM F1807 and ASTM F1960 were added to the document as part of First Revision 3. As such, ASTM F1807 and ASTM F1960 have been added to section 2.3.



Public Input No. 28-NFPA 13D-2025 [Section No. 3.3.5]

3.3.5 Dwelling.

Any detached building, or any part of a townhouse ~~, back-to-back townhouse, or stacked townhouse~~ structure that is separated from the remainder of the townhouse structure with fire resistance rated assemblies in accordance with local building code, that contains no more than two dwelling units intended to be used, rented, leased, let, or hired out to be occupied or that are occupied for habitation purposes.

Statement of Problem and Substantiation for Public Input

In a previous cycle, the differing definitions for types of townhouses were accepted in 1st draft and removed later in the process. This language appears to be left over and should be deleted.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 10:17:37 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: [FR-20-NFPA 13D-2025](#)

Statement: In a previous cycle, the differing definitions for types of townhouses were accepted in 1st draft and removed later in the process. This language appears to be left over and was deleted.



Public Input No. 29-NFPA 13D-2025 [Section No. 3.3.9.1]

3.3.9.1 Supply Pressure.

The pressure ~~within~~ provided from the supply- ~~(e.g., city or private supply water source)~~

A.3.3.9.1 The water supply can be from a public or private water main, wells, and tanks .

Statement of Problem and Substantiation for Public Input

Manual of style. Examples should be in the annex.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 10:20:15 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-22-NFPA 13D-2025

Statement: The definition is redundant in that it essentially just rearranges the term “supply pressure” to define “supply pressure.”

**Public Input No. 30-NFPA 13D-2025 [Section No. 3.3.9.2]****3.3.9.2 System Pressure.**

The pressure within the system- ~~(e.g., above the control valve).~~

Statement of Problem and Substantiation for Public Input

Manual of Style.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 10:23:25 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-23-NFPA 13D-2025

Statement: The definition is redundant in that it essentially just rearranges the term “system pressure” to define “system pressure.” The example is also not accurate.



Public Input No. 12-NFPA 13D-2025 [Section No. 3.3.10]

3.3.10 Pump.

A mechanical device that transfers or raises ~~, or transfers and raises,~~ the pressure of a fluid (water).

Statement of Problem and Substantiation for Public Input

The definition includes duplicative language that should be removed.

Submitter Information Verification

Submitter Full Name: Steven Orłowski
Organization: Sundowne Building Code Consult
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 14 08:31:21 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-21-NFPA 13D-2025

Statement: The ordinarily accepted meaning from Merriam-Webster is sufficient for this definition. No definition in NFPA 13D is needed.



Public Input No. 3-NFPA 13D-2024 [New Section after 3.3.17]

Dwelling.

Any building that contains not more than one or two dwelling units intended to be used, rented, leased, let, or hired out to be occupied or that are occupied for habitation purposes.

Dwelling Unit.

One or more rooms, arranged for the use of one or more individuals living together, as in a single housekeeping unit, that normally have cooking, living, sanitary, and sleeping facilities.

Manufactured Home.

A structure, transportable in one or more sections, that in the traveling mode is 8 body ft (2.4m) or more in width and 40 body ft (12m) or more in length or, where erected on-site, is 320ft² (28 m²) or more, and that is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation where connected to the required utilities, and includes the plumbing, heating, air conditioning, and electrical systems contained therein.

Residential Occupancies.

Occupancies, as specified in the scope of this standard, that include the following, as defined in NFPA 101, Life Safety Code:

___(a) Apartment buildings;

___(b) Lodging and rooming houses;

___(c) Board and care facilities (slow evacuation type with 16 or fewer occupants and prompt evacuation type);

___(d) Hotels, motels, and minorities.

Statement of Problem and Substantiation for Public Input

Updated Definitions

Submitter Information Verification

Submitter Full Name: Darwis Urena

Organization: 134th Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Sat Nov 09 09:59:28 EST 2024

Committee: AUT-RSS

Committee Statement

Resolution: The definitions are catered towards NFPA 13D. The submitter did not include a justification for using these definitions.



Public Input No. 38-NFPA 13D-2025 [Section No. 5.2.5 [Excluding any Sub-Sections]]

Fittings used in sprinkler systems shall be of the materials listed in Table 5.2.5 or shall be in accordance with 5.2.9.

Table 5.2.5 Fitting Materials and Dimensions

<u>Materials and Dimensions</u>	<u>Standard</u>
<u>PEX:</u>	
<u>Fittings for PEX*</u>	-
<u>*Fittings for use with PEX tubing shall be listed as a system with PEX tubing in accordance with UL 1821 for sprinkler system use.</u>	<u>ASTM 1960</u>
<u>Cast Iron:</u>	
Gray iron threaded fittings, Classes 125 and 250	ASME B16.4
Gray iron pipe flanges and flanged fittings, Classes 25, 125, and 250	ASME B16.1
<u>Malleable Iron:</u>	-
Malleable iron threaded fittings, Classes 150 and 300	ASME B16.3
<u>Steel:</u>	-
Factory-made wrought butt welding fittings	ASME B16.9
Butt welding ends	ASME B16.25
Piping fittings of wrought carbon steel and alloy steel for moderate and high temperature service	ASTM A234/A234M
Pipe flanges and flanged fittings, NPS 1/2 through NPS 24 metric/inch standard	ASME B16.5
Forged fittings, socket-welding and threaded	ASME B16.11
<u>Copper:</u>	-
Wrought copper and copper alloy solder joint pressure fittings	ASME B16.22
Cast copper alloy solder joint pressure fittings	ASME B16.18
Cast copper alloy threaded fittings: Classes 125 and 250	ASME B16.15

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
5_2_5_PPFA.png	5.2.5 correct proposal	

Statement of Problem and Substantiation for Public Input

Since there are fittings listed for other systems, there should be listed fittings for PEX systems, and this would include a footnote that the fittings shall be listed as a system with PEX tubing in accordance with UL 1821. ASTM F1960 is the standard for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing.

I had difficulty modifying the table with the NFPA system - I did not intend to modify other sections and ideally, the entire table should be alphabetized. I added an image to show the proposal.

Submitter Information Verification

Submitter Full Name: Mike Cudahy

Organization: PPFA (Plastic Pipe and Fittings Association)

Affiliation: PPFA (Plastic Pipe and Fittings Association)

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 02 13:48:50 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: This public input is in the wrong location. Placing the requirements for PEX in Table 5.2.5 would allow for PEX pipe and fittings to not be listed. PEX pipe and fittings are required to be listed in order to be used in an NFPA 13D system.

Fittings used in sprinkler systems shall be of the materials listed in Table 5.2.5 or shall be in accordance with 5.2.9.

Table 5.2.5 Fitting Materials and Dimensions

<u>Materials and Dimensions</u>	<u>Standard</u>
<u>PEX:</u>	
<u>Fittings for PEX*</u>	-
<u>*Fittings for use with PEX tubing shall be listed as a system with PEX tubing in accordance with UL 1821 for sprinkler system use.</u>	<u>ASTM 1960</u>



Public Input No. 40-NFPA 13D-2025 [New Section after 5.2.9.2]

5.2.9.3

Fittings for use with PEX tubing shall comply with the portions of the ASTM standards specified in Table 5.2.9.3. PEX tubing and fittings shall be listed together as a system from one supplier.

Table 5.2.9.3 Specifically Listed Fittings Materials and Dimensions for PEX Tubing

<u>Materials and Dimensions</u>	<u>Standard</u>
Cold expansion fittings with PEX reinforcing rings	ASTM F1960

Statement of Problem and Substantiation for Public Input

In the current version of NFPA 13D Table 5.2.3.2 lists the specifically listed pipe and tubing materials of CPVC and PEX. In Section 5.2.9 there are provisions for fittings for use with the CPVC pipe called out in Table 5.2.3.2, but there are currently no specifications for fittings for use with PEX tubing materials. This proposed change adds an additional subsection in 5.2.9 with table for fittings for use with PEX tubing.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 41-NFPA 13D-2025 [Section No. 2.3.2]	

Submitter Information Verification

Submitter Full Name: David Nickelson
Organization: Uponor
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 03 10:58:46 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-3-NFPA 13D-2025

Statement: The table only had listed fittings for CPVC and not for PEX. The appropriate material and dimensional standards were added to the table for PEX. "CVPC" was corrected to "CPVC."



Public Input No. 13-NFPA 13D-2025 [Section No. 6.2.1]

6.2.1

Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

- (1) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler K-factor on the system.
- (2) * Pump motors using ac power shall be rated for a nominal 240 V single phase and wired in accordance with the ~~NEC~~ (*NFPA 70*) .
- (3) Any disconnecting means for the pump shall be approved.
- (4) The pump shall be located not less than 1½ in. off the floor.

A.6.2.1(2). Voltage ratings are nominal and the 240 V requirement should not preclude a 230 V motor from being used.

Statement of Problem and Substantiation for Public Input

As users of NFPA 13D are not necessarily experts in electrical requirements, the AC power requirements for pump motors should specify that these are nominal values as we have had motors rejected for having ratings of 230 V

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: AFSA Technical Advisory Council
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 23 16:54:56 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-5-NFPA 13D-2025

Statement: This revision allows AC power requirements for pump motors using nominal values and would allow motors that are often rejected for having ratings of 230 V. Metric equivalent added to 6.2.1(4).



Public Input No. 20-NFPA 13D-2025 [Section No. 6.2.3]

6.2.3*

Where more than one dwelling unit is served by the same water supply pipe, each dwelling unit shall have an individual control valve that serves the fire sprinkler system in that dwelling unit ~~and the owner~~.

6.2.3.1

The owner or occupant shall have access to the valve that controls the sprinkler system in their unit.

6.2.3.

4

2

A single control valve shall be permitted for all units if the control valve is located in a location accessible to all occupants.

6.2.3.3

The control valve shall be permitted to serve the domestic water supply.

6.2.3.2 4

In the situation addressed by 6.2.3, no valve controlling the sprinkler system in a unit shall be located in another unit.

6.2.3.3 5 *

Where a well pump is the source of supply for both the fire sprinkler system and the domestic water system 6.1.4 and Section 6.5 shall apply.

Statement of Problem and Substantiation for Public Input

This PI starts with correcting a manual of style issue (2 shall statements). It also adds an allowance for a single control valve for more than one unit if accessible.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 18-NFPA 13D-2025 [Section No. 1.1.1]</u>	

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 26 16:17:34 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-6-NFPA 13D-2025

Statement: Often the occupant is not the owner. Revision has been made to include owner or occupant as the person required to have access to the control valve. It can be helpful to emergency responders to have a single control valve or location to access when responding. This also corrects a manual of style issue removing two shall statements from one section.



Public Input No. 22-NFPA 13D-2025 [Section No. 7.1.2]

7.1.2

The sprinkler system piping shall not have separate control valves installed unless valves are locked open or supervised by one of the following methods:

- (1) Central station, proprietary, or remote station alarm service
- (2) Local alarm service that causes the sounding of an audible signal at a constantly attended location
- (3) ~~Valves that are locked open~~

Statement of Problem and Substantiation for Public Input

When reading the charging statement that separate controls are not necessary, provided one of the following supervised methods are used, locked valves are not a type of supervised device like items 1 or 2. Suggest deleting item #3 and adding the language in the charging statement as shown. This editorial change does not change the intent or requirements.

Submitter Information Verification

Submitter Full Name: Steven Orlowski
Organization: Sundowne Building Code Consultants, LLC
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 28 08:29:05 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: Locking valves open is an accepted method of supervision.

**Public Input No. 31-NFPA 13D-2025 [Section No. 7.5.6]****7.5.6 Temperature Ratings.****7.5.6.1**

~~Sprinklers~~ Link style sprinklers installed where maximum ambient ceiling temperatures do not exceed 100°F (38°C) shall be ordinary temperature-rated or intermediate-temperature rated sprinklers throughout unless modified by the requirements of 7.5.6.3 5.

7.5.6.2

—

Sprinklers

Bulb style sprinklers installed where maximum ambient ceiling temperatures do not exceed 120°F (49°C) shall be ordinary temperature-rated or intermediate-temperature rated sprinklers throughout unless modified by the requirements of 7.5.6.5 .

7.5.6.3

Link style sprinklers installed where maximum ambient ceiling temperatures are between 101°F and 150°F (38°C and 65°C) shall be intermediate temperature-rated sprinklers unless modified by 7.5.6.3 5.

7.5.6.

3

4

Bulb style sprinklers installed where maximum ambient ceiling temperatures are between 121°F and 150°F (49.5°C and 65°C) shall be intermediate temperature-rated sprinklers unless modified by 7.5.6.5 .

7.5.6.5 *

The following practices shall be observed when installing residential sprinklers unless higher expected ambient temperatures require a higher temperature rating:

- (1) Sprinklers under glass or plastic skylights exposed to direct rays of the sun shall be of intermediate temperature classification.
- (2) Sprinklers in an unventilated concealed space under an uninsulated roof or in an unventilated attic shall be of intermediate temperature classification.
- (3) * Sprinklers installed near specific heat sources that are identified in Table 7.5.6.3 shall be of the temperature rating indicated in Table 7.5.6.3 unless sprinklers are listed for positioning closer to the heat source.
- (4) Sprinklers installed in saunas and steam rooms where the maximum ambient ceiling temperatures are between 151°F and 225°F (66°C to 107°C) shall be high temperature-rated spray sprinklers.
- (5) Sprinklers in closets containing ventless clothes dryers shall be of the intermediate temperature classification or higher.

Table 7.5.6.3 Minimum Distances for Ordinary and Intermediate Temperature Residential Sprinklers

Heat Source	<u>From Edge of Source to Ordinary Temperature Sprinkler</u>			<u>From Edge of Source to Intermediate Temperature Sprinkler</u>	
	<u>in.</u>	<u>mm</u>	-	<u>in.</u>	<u>mm</u>
Side of open or recessed fireplace	36	900	-	12	300
Front of recessed fireplace	60	1500	-	36	900
Coal- or wood-burning stove	42	1050	-	12	300
Kitchen range	18	450	-	9	225
Wall oven	18	450	-	9	225
Hot air flues	18	450	-	9	225
Uninsulated heat ducts	18	450	-	9	225
Uninsulated hot water pipes	12	300	-	6	150
Side of ceiling- or wall-mounted hot air diffusers	24	600	-	12	300
Front of wall-mounted hot air diffusers	36	900	-	18	450
Hot water heater or furnace	6	150	-	3	75
Light fixture except LED	-	-	-	-	-
0 W–250 W	6	150	-	3	75
250 W–499 W	12	300	-	6	150

Statement of Problem and Substantiation for Public Input

This PI incorporates temperature requirements that changed to allow ordinary bulb sprinklers up to 120 degrees.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 10:41:12 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: [FR-7-NFPA 13D-2025](#)

Statement: This aligns NFPA 13D, with NFPA 13.



Public Input No. 24-NFPA 13D-2025 [Section No. 7.7]

7.7 – Attics:

~~When nonmetallic piping is installed in attics, adequate insulation shall be provided on the attic side of the piping to avoid exposure of the piping to temperatures in excess of the pipe's rated temperature.~~

Statement of Problem and Substantiation for Public Input

The existing language of section 7.7 for protecting nonmetallic piping from freezing seems misplaced and should be relocated to section 9.1.2 for systems in areas subject to freezing.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 23-NFPA 13D-2025 [Section No. 9.1.2.1]</u>	Relocating section 7.7 to 9.1.2.

Submitter Information Verification

Submitter Full Name: Steven Orlowski
Organization: Sundowne Building Code Consultants, LLC
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 28 08:38:43 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: This section is not intended to protect water in the pipe from freezing. It is intended to protect the pipe in an attic from high temperatures.



Public Input No. 25-NFPA 13D-2025 [Section No. 8.1.2]

8.1.2 – Nonresidential Sprinklers:

~~Sprinklers other than residential sprinklers shall be installed in accordance with the coverage criteria specified by NFPA 13.~~

Statement of Problem and Substantiation for Public Input

Based on the scope of NFPA 13D, any portion of a one- and two-family dwelling, manufactured house or townhouse would be considered part of the residential portions of the building. The statement on nonresidential portions in NFPA 13D is not needed and should be removed to avoid any confusion.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 26-NFPA 13D-2025 [Section No. 8.2.3]	
Public Input No. 27-NFPA 13D-2025 [Section No. A.1.1]	

Submitter Information Verification

Submitter Full Name: Steven Orlowski
Organization: Sundowne Building Code Consultants, LLC
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 28 08:44:17 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: In some areas, such as a sauna, a residential sprinkler could not be installed. This requirement allows for sprinklers to be installed where very high temperature sprinklers are required and no residential sprinklers are available for the installation.



Public Input No. 26-NFPA 13D-2025 [Section No. 8.2.3]

8.2.3 – Nonresidential Sprinklers:

~~Sprinklers other than residential sprinklers shall be positioned in accordance with the positioning criteria specified by NFPA 13.~~

Statement of Problem and Substantiation for Public Input

Based on the scope of NFPA 13D, any portion of a one- and two-family dwelling, manufactured house or townhouse would be considered part of the residential portions of the building. The statement on nonresidential portions in NFPA 13D is not needed and should be removed to avoid any confusion.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 25-NFPA 13D-2025 [Section No. 8.1.2]	
Public Input No. 27-NFPA 13D-2025 [Section No. A.1.1]	

Submitter Information Verification

Submitter Full Name: Steven Orlowski
Organization: Sundowne Building Code Consultants, LLC
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 28 08:46:10 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: In some areas, such as a sauna, a residential sprinkler could not be installed. This requirement allows for sprinklers to be installed where very high temperature sprinklers are required and no residential sprinklers are available for the installation.



Public Input No. 46-NFPA 13D-2025 [New Section after 8.2.5.1.5]

8.2.5.1.6

In hallways up to 6ft in width and within 6ft to the end of a corridor, sprinklers shall be permitted to be located adjacent to obstructions where the sprinkler is installed in the allowable obstruction zone as shown in figure 8.2.5.1.6 and the closest edge of the obstruction is a minimum of 12 in. away from the centerline of the sprinkler.

Statement of Problem and Substantiation for Public Input

Items such as exit signs, cameras and emergency lighting is commonly added that for obstruction to the sprinklers at the end of corridors/hallways. Water during discharge will spray hitting the close adjacent walls and provide water and cooling in the spaces all around the small obstructions.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Associ
Affiliation: NFSA Engineering and Standards (E&S) Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 12:37:46 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-8-NFPA 13D-2025

Statement: Items such as exit signs, cameras and emergency lighting are commonly added and can be an obstruction to the sprinklers at the end of corridors/hallways. Water during discharge will spray hitting the close adjacent walls and provide water and cooling in the spaces all around the small obstructions.



Public Input No. 14-NFPA 13D-2025 [Section No. 8.2.6]

8.2.6.4 * Exposed Barrel Lengths for Dry Sprinklers.

8.2.4.6-1

Where dry sprinklers are connected to wet pipe sprinkler systems protecting areas subject to freezing temperatures, the minimum exposed length of the barrel of the dry sprinkler shall be in accordance with Table 8.2.4.6-1(a) or Table 8.2.4.6-1(b).

~~Table 8~~ Table 9.2.4.6-1(a) Exposed Barrel Lengths for Dry Sprinklers (US Customary Units)

<u>Average Annual Extreme Minimum Temperature Exposed to Discharge End of Sprinkler</u>	<u>Minimum Exposed Barrel Length when Exposed to 40°F</u>	<u>Minimum Exposed Barrel Length when Exposed to 50°F</u>	<u>Minimum Exposed Barrel Length when Exposed to 60°F</u>
(°F)	(in.)	(in.)	(in.)
40	0	0	0
30	0	0	0
20	4	0	0
10	8	1	0
0	12	3	0
-10	14	4	1
-20	14	6	3
-30	16	8	4
-40	18	8	4
-50	20	10	6
-60	20	10	6

~~Table 8~~ Table 9.2.4.6-1(b) Exposed Barrel Lengths for Dry Sprinklers (Metric Units)

<u>Average Annual Extreme Minimum Temperature Exposed to Discharge End of Sprinkler</u>	<u>Minimum Exposed Barrel Length when Exposed to 4°C</u>	<u>Minimum Exposed Barrel Length when Exposed to 10°C</u>	<u>Minimum Exposed Barrel Length when Exposed to 16°C</u>
(°C)	(mm)	(mm)	(mm)
4	0	0	0
-1	0	0	0
-7	100	0	0
-12	200	25	0
-18	300	75	0
-23	350	100	25
-29	350	150	75
-34	400	200	100
-40	450	200	100
-46	500	250	150
-51	500	250	150

89.24.6.2

The minimum barrel length shall be measured from the face of the fitting to which the dry sprinkler is installed to the inside surface of the insulation, wall, or ceiling leading to the cold space, whichever is closer to the fitting.

Statement of Problem and Substantiation for Public Input

This section is more appropriate in Chapter 9 for Freeze Protection

Submitter Information Verification

Submitter Full Name: Kevin Hall

Organization: American Fire Sprinkler Association

Affiliation: AFSA Technical Advisory Council

Street Address:

City:

State:

Zip:

Submittal Date: Fri May 23 16:57:44 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-25-NFPA 13D-2025

Statement: This section is more appropriate in Chapter 9 for Freeze Protection.



Public Input No. 39-NFPA 13D-2025 [Section No. 8.3.2]

8.3.2

Sprinklers shall not be required in bathrooms- of 55 ft² (5.1 m²) and less- , laundry rooms or laundry areas.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NAHB_PI_-_Section_8.3.2_-_Reason_statement.pdf	Reason statement attachment - Section 8.3.2 - NAHB PI	

Statement of Problem and Substantiation for Public Input

Please see attached reason statement.

Submitter Information Verification

Submitter Full Name: Daniel Buuck
Organization: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 02 16:43:07 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: In modern homes, bathrooms are being constructed larger and larger. While data collected shows a low number of deaths in this area, fires in laundry rooms and areas are common.

Reason:

According to the Annex A Explanatory Material, NFPA 13D “permits sprinklers to be omitted in certain areas. These areas have been proved by NFPA [see *Table A.1.2(a)*, *Table A.1.2(b)*, and *Table A.1.2(c)*] to be those where the incidence of life loss from fires in dwellings is low. Such an approach provides a reasonable degree of fire safety” (A.1.2).

Table A.1.2(a) (reproduced below with red lines added) lists the area of origin in descending order of annual civilian deaths. The top of the list includes living room, family room, den, bedroom and kitchen, and then comes other known area of origin and unclassified function and structural areas. Below that are areas which are currently exempted according to Section 8.3, such as garages, balconies, porches, substructure areas and crawl spaces. These areas each account for 2% of civilian deaths.

Table A.1.2(a) Reported One- or Two-Family Home Structure Fires by Area of Origin: 2013–2017 Annual Averages						
Area of Origin	Civilian Deaths	Civilian Percent	Fires	Percent	Injuries	Percent
Living room, family room, or den	540	24	10,100	4	760	10
Bedroom	500	23	18,300	7	1,460	20
Kitchen or cooking area	350	16	82,000	34	2,470	34
Other known area of origin	220	10	30,000	12	660	9
Unclassified function area	200	9	5,800	2	310	4
Unclassified structural area	70	3	4,500	2	90	1
Garage or vehicle storage area*	60	2	9,000	4	360	5
Exterior balcony or unenclosed porch	50	2	6,000	2	160	2
Unclassified area of origin	50	2	5,400	2	80	1
Substructure area or crawl space	40	2	4,200	2	120	2
Laundry room or area	30	1	8,000	3	220	3
Lavatory or bathroom	30	1	4,800	2	160	2
Attic or ceiling/roof assembly or concealed space	20	1	8,300	3	90	1
Wall assembly or concealed space	20	1	5,200	2	60	1
Courtyard, patio, terrace	20	1	3,900	2	90	1
Unclassified outside area	10	0	10,400	4	60	1
Exterior wall surface	10	0	8,400	3	100	1
Heating equipment room	10	1	4,100	2	80	1
Confined chimney or flue fire†	0	0	16,200	7	20	0
Total:	2,220	100	244,400	100	7,330	100

Source: NFIRS 5.0 and the NFPA fire experience survey (Published report: “Home Structure Fires: Supporting Tables,” 2019, Table 10A).

Note: Sums might not equal totals due to rounding errors.

*Does not include fires with property use coded as residential garage.

†NFIRS 5.0 does not have a separate area of origin code for fires starting in chimneys. Any home fire with NFIRS incident type 114 — “Chimney of fire originating in and confined to a chimney or flue” is captured here.

Below that on the list are laundry areas and bathrooms (all sizes) which each account for just 1% of civilian deaths. Logically, these should be exempted from where sprinklers are located, too, and that is what this Public Input does.

The NFPA Home Fires Report from 4/2023 provides the latest incident numbers and shows the percentages have not changed.



Public Input No. 19-NFPA 13D-2025 [Section No. 8.3.3]

8.3.3

Sprinklers shall not be required in clothes closets, linen closets, or pantries with or without doors that meet all of the following conditions:

- (1) The area of the space does not exceed 24 ft² (2.2 m²).
- (2) The walls and ceilings are surfaced with noncombustible or limited-combustible materials as defined in NFPA 220.
- (3) The closets without doors meet the definition of a compartment (see 3.3.3).
- (4) The presence of electrical or data panels is permitted.

Statement of Problem and Substantiation for Public Input

There has been a trend where AHJ's have been requiring sprinklers in closets that are in accordance with this section because of the presence of an electrical or data panel. The presence of a dwelling unit electrical panel should not require protection.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Mon May 26 16:11:22 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-9-NFPA 13D-2025

Statement: There has been a trend where AHJ's have been requiring sprinklers in closets that are in accordance with this section because of the presence of an electrical panel. The revised language clarifies that the installation of an electrical panel does not change the omission requirements.



Public Input No. 43-NFPA 13D-2025 [New Section after 8.3.4]

8.3.4.1

Where EV Chargers or wiring for future EV Chargers are provided in garages, sprinkler protection shall be provided

Statement of Problem and Substantiation for Public Input

The added chance of fire by EV Vehicle/Chargers should have sprinkler protection. This protection may delay fire spread and notify occupants to Escape safely.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 44-NFPA 13D-2025 [New Section after 8.3.4]</u>	

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Associ
Affiliation: NFSA Engineering and Standards (E&S) Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 12:02:04 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: No data has been provided to support adding this requirement. NFPA 13D does not currently require sprinklers in garages. This requirement would now require sprinklers in many garages. This also does not address items currently installed in garages such as energy storage systems.



Public Input No. 16-NFPA 13D-2025 [Section No. 8.3.5.1 [Excluding any Sub-Sections]]

~~Such spaces~~ Spaces identified in 8.3.5 that contain fuel-fired equipment shall also comply with 8.3.5.1.1 or 8.3.5.1.2.

Statement of Problem and Substantiation for Public Input

There is current confusion with the enforcement of this requirement because of the use of "such spaces." This section should be modified to identify that the specific spaces that are applicable to the fuel-fired equipment requirements are the spaces identified in section 8.3.5.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: AFSA Technical Advisory Council
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 23 17:21:06 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-11-NFPA 13D-2025

Statement: There is current confusion with the enforcement of this requirement because of the use of "such spaces." This section should be modified to identify that the specific spaces that are applicable to the fuel-fired equipment requirements are the spaces identified in section 8.3.5.

**Public Input No. 32-NFPA 13D-2025 [Section No. 8.3.7]****8.3.7**

Sprinklers shall not be required for ceiling pockets that meet the following conditions:

- (1) The total volume of all unprotected ceiling pockets in a compartment does not exceed 100 ft³ (2.8 m³).
- (2) The entire floor under the unprotected ceiling pocket is protected by sidewall or pendent sprinklers at the lower ceiling elevation with sprinkler deflectors measured to the lower ceiling.
- (3) * The interior finish of the unprotected ceiling pocket excluding decorative treatments is noncombustible or limited-combustible material.
- (4) Skylights not exceeding 32 ft² (3 m²) shall be permitted to have a plastic cover.

Statement of Problem and Substantiation for Public Input

This clarifies that the deflectors of the sprinklers at the lower ceilings do not need to be measured to the top of the ceiling pocket.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 10:58:56 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-12-NFPA 13D-2025

Statement: This clarifies that the deflectors of the sprinklers at the lower ceilings do not need to be measured to the top of the ceiling pocket.



Public Input No. 21-NFPA 13D-2025 [New Section after 8.3.9]

8.3.10 Interior Stairs.

8.3.10.1 _

Except as allowed by 8.3.10.2 and 8.3.10.3, sprinklers shall be installed throughout all interior stairs located within dwelling units.

8.3.10.2 * _

Sprinklers shall not be required underneath stair risers in dwelling units where the walls and ceilings are surfaced with noncombustible or limited-combustible finishes.

8.3.10.3* _

Bathrooms and closets located underneath stairs shall be protected in accordance with 8.3.2, 8.3.3, and 8.3.9.



A.8.3.10.2

Sprinklers are not required to be spaced along the angled portion underneath stair risers in dwelling units. Stairways have a very small fuel load as they are used primarily for egress. Sprinklers spaced along the slope will likely not operate unless they are directly over a fire. Sprinklers installed at the landings on either end of the stair riser will provide the protection desired by this standard.

A.8.3.10.3

Where a bathroom is located beneath a stair it is not the intent of this standard that the bathroom be sprinkler protected if the bathroom area does not exceed 55 ft² (5.1 m²). A clothes closet, linen closet, or pantry meeting the requirements of 8.3.3 would not require sprinkler protection because it is under a stair which could be the means of egress.

Statement of Problem and Substantiation for Public Input

This PI borrows language from NFPA 13R for protection of stairs within dwelling units. It also elaborates on the presence of bathrooms and closets located under stairs.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Mon May 26 16:30:58 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-13-NFPA 13D-2025

Statement: Language has been taken from NFPA 13R for protection of stairs within dwelling units. It also elaborates on the presence of bathrooms and closets located under stairs.

**Public Input No. 45-NFPA 13D-2025 [New Section after 8.3.10.3]****8.3.11 Exterior Protection for Wildfires. (reserved)****Statement of Problem and Substantiation for Public Input**

Place holder for future development of protection against wildfires. With added attention to current wildfires sprinkler protection should be considered. This reserved section will provide a place for this within the standard.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Associ
Affiliation: NFSA Engineering and Standards (E&S) Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 04 12:15:13 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: The scope and intent of NFPA 13D is for protection against fire hazards in one- and two-family dwellings that originate from a single ignition location. This is not the appropriate document for protection against wildfires. There is also a concern that exterior protection systems could deplete the water supply for emergency responders. The committee believes that this is an important topic and should be addressed by NFPA.



Public Input No. 33-NFPA 13D-2025 [Section No. 9.1.1]

9.1.1* Wet Pipe Systems.

A wet pipe system shall be permitted to be used where all piping is installed in areas not subject to freezing, ~~including areas properly insulated to maintain 40°F (4°C) .~~

Statement of Problem and Substantiation for Public Input

This PI correlates the temperature requirements with NFPA 13 which has removed the 40 degree threshold.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 11:01:40 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: [FR-14-NFPA 13D-2025](#)

Statement: This revision aligns the text with NFPA 13 and NFPA 13R.



Public Input No. 23-NFPA 13D-2025 [Section No. 9.1.2.1]

9.1.2.1

Where any portion of a system is subject to freezing and the temperature cannot be maintained at or above freezing, the pipe shall be protected against freezing by use of one of the following methods:

- (1) Dry pipe system and preaction systems in accordance with Section 9.3
- (2) Antifreeze system in accordance with Section 9.2
- (3) Listed standard dry pendent or dry sidewall sprinklers extended from pipe in heated areas into unheated areas not intended for living purposes
- (4) * Listed heat tracing provided that it is installed and insulated in accordance with manufacturer's instructions, specifically heat tracing used on branch lines is listed for branch lines of fire sprinkler systems
- (5) Listed residential dry pendent or dry sidewall sprinklers extended from pipe in heated areas into unheated areas
- (6) When nonmetallic piping is installed in attics, adequate insulation shall be provided on the attic side of the piping to avoid exposure of the piping to temperatures in excess of the pipe's rated temperature

Statement of Problem and Substantiation for Public Input

The existing language of section 7.7 for protecting nonmetallic piping from freezing seems misplaced and should be relocated to section 9.1.2 for systems in areas subject to freezing.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 24-NFPA 13D-2025 [Section No. 7.7]</u>	

Submitter Information Verification

Submitter Full Name: Steven Orlowski
Organization: Sundowne Building Code Consultants, LLC
Affiliation: National Association of Home Builders
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 28 08:32:52 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: The requirement is to protect pipe in attics from heat, not freezing.

**Public Input No. 34-NFPA 13D-2025 [Section No. 9.2]****9.2* Antifreeze Systems.****9.2.1* Conformity with Health Regulations.**

The use of antifreeze solutions shall be in conformity with any state or local health regulations.

9.2.2* Antifreeze Solutions.**9.2.2.1**

Except as permitted in 9.2.2.2, antifreeze solutions shall be listed for use in new sprinkler systems.

9.2.2.1.1

For existing systems, antifreeze solutions shall be limited to premixed antifreeze solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent) at a maximum concentration of 50 percent by volume, propylene glycol at a maximum concentration of 40 percent by volume, or other solutions listed specifically for use in fire protection systems.

9.2.2.2*

Premixed solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent at a maximum concentration of 48 percent by volume or propylene glycol at a maximum concentration of 38 percent by volume shall be permitted to protect piping that is supplying sprinklers in a specific area of the dwelling unit, where acceptable to the authority having jurisdiction.

9.2.2.2.1*

Documentation shall be presented to the AHJ to substantiate the use of the antifreeze solution.

9.2.2.3*

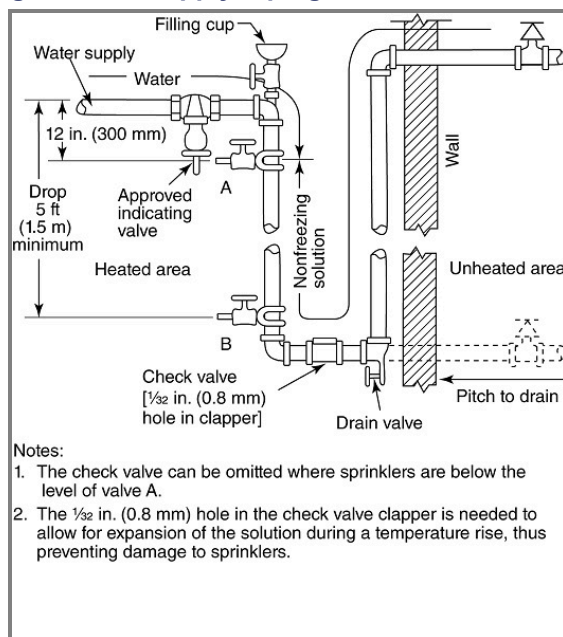
The specific gravity of the antifreeze solution shall be checked by a hydrometer with a scale having 0.002 subdivisions.

9.2.3* Arrangement of Supply Piping and Valves.**9.2.3.1 Connections Between Antifreeze System and Wet Pipe System with No Backflow Prevention Device.**

9.2.3.1.1

A 5 ft (1.5 m) drop pipe, or U-loop, shall be installed in the connection between the antifreeze system and the wet pipe system as illustrated in Figure 9.2.3.1.1.

Figure 9.2.3.1.1 Arrangement of Supply Piping and Valves.

**9.2.3.1.2**

If sprinklers are above the level of the water supply to the antifreeze system, a check valve with a $\frac{1}{2}$ in. (0.8 mm) hole in the clapper shall be provided in the U-loop.

9.2.3.1.3

Valves shall be provided as illustrated in Figure 9.2.3.1.1.

9.2.3.1.4

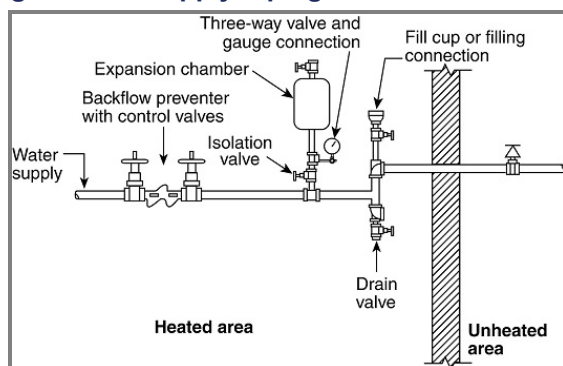
Arrangement of supply piping when the water supply comes from a storage tank or the water supply feeds through a check valve that does not have a $\frac{1}{2}$ in. (0.8 mm) hole drilled in the clapper shall meet the requirements of 9.2.3.2.2.

9.2.3.2* Connections Between Antifreeze System and Wet Pipe System with Backflow Prevention Device Installed.

9.2.3.2.1

Valves shall be provided as illustrated in Figure 9.2.3.2.1.

Figure 9.2.3.2.1 Arrangement of Supply Piping with Backflow Device.

**9.2.3.2.2**

An expansion chamber shall be provided as illustrated in Figure 9.2.3.2.1.

9.2.3.2.3

The expansion chamber shall be sized based on the minimum and maximum volume of the antifreeze solution over the life of the system.

9.2.4 Hydrostatic Test.

Where pendent sprinklers are utilized, and where a hydrostatic test shall be performed, the hydrostatic test shall be performed with water and then the water shall be completely drained before antifreeze solution is placed in the system, or the hydrostatic test shall be performed with antifreeze solution at the proper concentration for the system.

9.2.5 Placard Information.

A placard shall be placed on the antifreeze system main valve that indicates the manufacturer type and brand of antifreeze solution, the concentration of antifreeze solution used, and the volume of the antifreeze solution used in the system.

Statement of Problem and Substantiation for Public Input

No changes have been made to the text. The Committee should look at using extracts from NFPA 13 for the majority of antifreeze requirements or simply point to NFPA 13.

Submitter Information Verification

Submitter Full Name: Peter Schwab

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Submittal Date: Wed May 28 11:04:16 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: No proposed revision was made.

**Public Input No. 48-NFPA 13D-2025 [Section No. 9.3.9]****9.3.9 ~~Air Supply~~ Pneumatic Supply .**

The system ~~air pressure~~ pneumatic pressure shall be maintained by approved equipment.

Statement of Problem and Substantiation for Public Input

Replacing "air" with "pneumatic" to be consistent with other NFPA documents.

Submitter Information Verification

Submitter Full Name: Kenneth Schneider
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Affiliation: United Association of Journeymen & Apprentices of the Piping Industry
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Submittal Date: Wed Jun 04 15:25:17 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: FR-15-NFPA 13D-2025

Statement: This revision replaces "air pressure" with "pneumatic" to be consistent with other NFPA documents.



Public Input No. 17-NFPA 13D-2025 [Section No. 10.4.3]

10.4.3

The pipes shall be sized using one of the following techniques:

- (1) The ~~simplified calculation~~ general pipe sizing method of 10.4.4, which can only be used for connections to a city water main of at least 4 in. (100 mm) in diameter
- (2) The prescriptive pipe sizing method of 10.4.9
- (3) The hydraulic calculation procedure for NFPA 13
- (4) The manufacturer's listed installation instructions

Statement of Problem and Substantiation for Public Input

The name of this calculation method needs to be changed to correlate with the requirements of section 10.4.4

Submitter Information Verification

Submitter Full Name: Kevin Hall

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Submittal Date: Fri May 23 17:22:23 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-16-NFPA 13D-2025

Statement: The name of this calculation method needs to be changed to correlate with the requirements of section 10.4.4



Public Input No. 35-NFPA 13D-2025 [Section No. 10.4.4]

10.4.4* General Pipe Sizing Method.

The following is the general pipe sizing method for straight-run systems connected to a city water main of at least 4 in. (100 mm) in diameter in accordance with 10.4.3(1):

- (1) The system flow rate shall be established in accordance with Sections 10.1 and 10.2, and it shall be determined that the flow allowed by the water meter meets or exceeds the system demand and that the total demand flow does not exceed the maximum flow allowed by the piping system components.
- (2) The water pressure in the street shall be determined.
- (3) Pipe sizes shall be selected.
- (4) * Pressure loss for a water meter, if any, shall be determined and deducted using one of the following:
 - (5) Table 10.4.4(a) shall be permitted to be used, even where the sprinkler demand flow exceeds the meter's rated continuous flow.
 - (6) Higher pressure losses specified by the manufacturer shall be used in place of those specified in Table 10.4.4(a).
 - (7) Lower pressure losses shall be permitted to be used where supporting data are provided by the meter manufacturer.
- (8) Pressure loss for elevation shall be deducted as follows:
 - (9) Building height above street (ft) $\times$ 0.433 = pressure loss (psi).
 - (10) Building height above street (m) $\times$ 0.098 = pressure loss (bar).
- (11) * Pressure losses from the city main to the inside control valve shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (12) Pressure loss for piping within the building shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (13) Pressure loss for valves and fittings shall be deducted as follows:
 - (14) The valves and fittings from the control valve to the farthest sprinkler shall be counted.
 - (15) The equivalent length for each valve and fitting as shown in Table 10.4.4(b), Table 10.4.4(c), Table 10.4.4(d), Table 10.4.4(e), or as specified by the manufacturer shall be determined and the values added to obtain the total equivalent length for each pipe size.
 - (16) The equivalent length for each size shall be multiplied by the pressure loss associated with the pipe material and the values totaled.
- (17) In multilevel buildings, the steps in 10.4.4(1) through 10.4.4(8) shall be repeated to size piping for each floor.
- (18) If the remaining pressure is less than the operating pressure established by the testing laboratory for the sprinkler being used, the sprinkler system shall be redesigned.
- (19) If the remaining pressure is higher than required, smaller piping shall be permitted to be used where justified by calculations.
- (20) The remaining piping shall be sized the same as the piping up to and including the farthest sprinkler unless smaller pipe sizes are justified by calculations.

Table 10.4.4(a) Pressure Losses in psi in Water Meters

<u>Meter Size</u> <u>(in.)</u>	<u>Flow (gpm) (L/min)</u>					
	<u>18 or less</u> <u>(68)</u>	<u>23 (87)</u>	<u>26 (98)</u>	<u>31 (117)</u>	<u>39 (148)</u>	<u>52 (197)</u>
5/8 (15 mm)	9 (0.67 bar)	14 (0.97 bar)	18 (1.2 bar)	26 (1.8 bar)	38 (2.6 bar)	*
3/4 (20 mm)	7 (0.48 bar)	11 (0.76 bar)	14 (1.5 bar)	22 (1.5 bar)	35 (2.4 bar)	*_
1 (30 mm)	2 (0.14 bar)	3 (0.21 bar)	3 (0.21 bar)	4 (0.28 bar)	6 (0.41 bar)	10 (0.69 bar)
1½ (40 mm)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	2 (0.14 bar)	4 (0.28 bar)	7 (0.48 bar)
2 (50 mm)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	3 (0.21 bar)

For SI units, 1 gpm = 3.785 L/min; 1 in. = 25 mm; 1 psi = 0.07 bar.

*Above maximum rated flow of commonly available meters.

Table 10.4.4(b) Equivalent Length in Feet of Fittings and Valves for Schedule 40 Steel Pipe

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	12 (3.7 m)	28 (8.5 m)	15 (4.6 m)	4 (1.2 m)
1¼ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
1½ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	5 (1.5 m)	3 (0.9 m)	10 (3 m)	3 (0.9 m)	1 (0.3 m)	24 (7.3 m)	57 (17.4 m)	28 (8.5 m)	7 (2.1 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(c) Equivalent Length in Feet of Fittings and Valves for Type K Copper Tube

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
¾ (20 mm)	0	1 (0.3 m)	0	3 (0.9 m)	1 (0.3 m)	0	7 (2.1 m)	14 (4.3 m)	7 (2.1 m)	2 (0.6 m)
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	14 (4.3 m)	33 (10 m)	18 (5.5 m)	5 (1.5 m)
1¼ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	14 (4.3 m)	32 (9.8 m)	16 (4.9 m)	5 (1.5 m)
1½ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	3 (0.9 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	28 (8.5 m)	66 (20.1 m)	33 (10 m)	8 (2.4 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(d) Equivalent Length in Feet of Fittings and Valves for Type L Copper Tube

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	8 (2.4 m)	18 (5.5 m)	10 (3 m)	3 (0.9 m)
1 (25 mm)	1 (0.3 m)	3 (0.9 m)	3 (0.9 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.6 m)	20 (6.1 m)	5 (2.1 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	20 (6.1 m)	47 (14.3 m)	24 (7.3 m)	7 (2.1 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	4 (1.2 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	30 (9.1 m)	71 (21.6 m)	35 (10.7 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(e) Equivalent Length in Feet of Fittings and Valves for Type M Copper Tube

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	10 (3 m)	21 (6.4 m)	11 (3.3 m)	3 (0.9 m)
1 (25 mm)	2 (0.6 m)	3 (0.9 m)	3 (0.9 m)	8 (2.4 m)	3 (0.9 m)	0	19 (5.8 m)	43 (13.1 m)	23 (7 m)	6 (1.8 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.5 m)	20 (6.1 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	21 (6.4 m)	50 (15.2 m)	26 (7.9 m)	7 (2.1 m)
2 (50 mm)	3 (0.9 m)	7 (2.1 m)	4 (1.2 m)	13 (4 m)	5 (1.5 m)	1 (0.3 m)	32 (9.8 m)	75 (22.9 m)	37 (11.3 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3048 m.

Statement of Problem and Substantiation for Public Input

Editorial. It appears that the 1" meter was left blank.

Submitter Information Verification

Submitter Full Name: Peter Schwab

Organization: Wayne Automatic Fire Sprinkler

Street Address:

City:

State:

Zip:

Submittal Date: Wed May 28 11:11:36 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-17-NFPA 13D-2025

Statement: Information for a 1" (25 mm) meter was left out of Table A in the last edition. A missing closing parentheses was added to Table B.



Public Input No. 6-NFPA 13D-2025 [Section No. 10.4.4]

10.4.4* General Pipe Sizing Method.

The following is the general pipe sizing method for straight-run systems connected to a city water main of at least 4 in. (100 mm) in diameter in accordance with 10.4.3(1):

- (1) The system flow rate shall be established in accordance with Sections 10.1 and 10.2, and it shall be determined that the flow allowed by the water meter meets or exceeds the system demand and that the total demand flow does not exceed the maximum flow allowed by the piping system components.
- (2) The water pressure in the street shall be determined.
- (3) Pipe sizes shall be selected.
- (4) * Pressure loss for a water meter, if any, shall be determined and deducted using one of the following:
 - (5) Table 10.4.4(a) shall be permitted to be used, even where the sprinkler demand flow exceeds the meter's rated continuous flow.
 - (6) Higher pressure losses specified by the manufacturer shall be used in place of those specified in Table 10.4.4(a).
 - (7) Lower pressure losses shall be permitted to be used where supporting data are provided by the meter manufacturer.
- (8) Pressure loss for elevation shall be deducted as follows:

~~Building height~~

- (a) Highest sprinkler above street (ft) × 0.433 = pressure loss (psi)

~~Building height~~

- (a) Highest sprinkler above street (m) × 0.098 = pressure loss (bar)

- (9) * Pressure losses from the city main to the inside control valve shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (10) Pressure loss for piping within the building shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (11) Pressure loss for valves and fittings shall be deducted as follows:
 - (12) The valves and fittings from the control valve to the farthest sprinkler shall be counted.
 - (13) The equivalent length for each valve and fitting as shown in Table 10.4.4(b), Table 10.4.4(c), Table 10.4.4(d), Table 10.4.4(e), or as specified by the manufacturer shall be determined and the values added to obtain the total equivalent length for each pipe size.
 - (14) The equivalent length for each size shall be multiplied by the pressure loss associated with the pipe material and the values totaled.
- (15) In multilevel buildings, the steps in 10.4.4(1) through 10.4.4(8) shall be repeated to size piping for each floor.
- (16) If the remaining pressure is less than the operating pressure established by the testing laboratory for the sprinkler being used, the sprinkler system shall be redesigned.
- (17) If the remaining pressure is higher than required, smaller piping shall be permitted to be used where justified by calculations.
- (18) The remaining piping shall be sized the same as the piping up to and including the farthest sprinkler unless smaller pipe sizes are justified by calculations.

Table 10.4.4(a) Pressure Losses in psi in Water Meters

Meter Size (in.)	Flow (gpm) (L/min)					
	18 or less (68)	23 (87)	26 (98)	31 (117)	39 (148)	52 (197)
5/8 (15 mm)	9 (0.67 bar)	14 (0.97 bar)	18 (1.2 bar)	26 (1.8 bar)	38 (2.6 bar)	*
3/4 (20 mm)	7 (0.48 bar)	11 (0.76 bar)	14 (1.5 bar)	22 (1.5 bar)	35 (2.4 bar)	*
	-	2 (0.14 bar)	3 (0.21 bar)	3 (0.21 bar)	4 (0.28 bar)	6 (0.41 bar) 10 (0.69 bar)
1 1/2 (40 mm)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	2 (0.14 bar)	4 (0.28 bar)	7 (0.48 bar)
2 (50 mm)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	3 (0.21 bar)

For SI units, 1 gpm = 3.785 L/min; 1 in. = 25 mm; 1 psi = 0.07 bar.

*Above maximum rated flow of commonly available meters.

Table 10.4.4(b) Equivalent Length in Feet of Fittings and Valves for Schedule 40 Steel Pipe

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	12 (3.7 m)	28 (8.5 m)	15 (4.6 m)	4 (1.2 m)
1 1/4 (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
1 1/2 (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	5 (1.5 m)	3 (0.9 m)	10 (3 m)	3 (0.9 m)	1 (0.3 m)	24 (7.3 m)	57 (17.4 m)	28 (8.5 m)	7 (2.1 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(c) Equivalent Length in Feet of Fittings and Valves for Type K Copper Tube

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
3/4 (20 mm)	0	1 (0.3 m)	0	3 (0.9 m)	1 (0.3 m)	0	7 (2.1 m)	14 (4.3 m)	7 (2.1 m)	2 (0.6 m)
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	14 (4.3 m)	33 (10 m)	18 (5.5 m)	5 (1.5 m)
1 1/4 (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	14 (4.3 m)	32 (9.8 m)	16 (4.9 m)	5 (1.5 m)
1 1/2 (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	3 (0.9 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	28 (8.5 m)	66 (20.1 m)	33 (10 m)	8 (2.4 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(d) Equivalent Length in Feet of Fittings and Valves for Type L Copper Tube

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	8 (2.4 m)	18 (5.5 m)	10 (3 m)	3 (0.9 m)
1 (25 mm)	1 (0.3 m)	3 (0.9 m)	3 (0.9 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.6 m)	20 (6.1 m)	5 (2.1 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	20 (6.1 m)	47 (14.3 m)	24 (7.3 m)	7 (2.1 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	4 (1.2 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	30 (9.1 m)	71 (21.6 m)	35 (10.7 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(e) Equivalent Length in Feet of Fittings and Valves for Type M Copper Tube

Diameter (in.)	45 Degree Elbow	90 Degree Elbow	Long- Radius Elbow	Tee or Cross (flow turned 90 degrees)	Tee or Cross (flow straight through)	Gate Valve	Angle Valve	Globe Valve	Globe "Y" Pattern Valve	Cock Valve
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	10 (3 m)	21 (6.4 m)	11 (3.3 m)	3 (0.9 m)
1 (25 mm)	2 (0.6 m)	3 (0.9 m)	3 (0.9 m)	8 (2.4 m)	3 (0.9 m)	0	19 (5.8 m)	43 (13.1 m)	23 (7 m)	6 (1.8 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.5 m)	20 (6.1 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	21 (6.4 m)	50 (15.2 m)	26 (7.9 m)	7 (2.1 m)
2 (50 mm)	3 (0.9 m)	7 (2.1 m)	4 (1.2 m)	13 (4 m)	5 (1.5 m)	1 (0.3 m)	32 (9.8 m)	75 (22.9 m)	37 (11.3 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3048 m.

Statement of Problem and Substantiation for Public Input

Current language appears to require use of wrong criteria. Current criteria in 10.4.4(5) and also on the Annex worksheet specifically requires the "Building height" to establish pressure loss from elevation, which is not relevant to the elevation of the highest sprinkler head. Why would the peak of the roof be relevant which could be 15' higher than the ceiling height? Are "building heights" generally available to the person designing the system? Gridded, Looped, and Networked systems would use calculations that account for the sprinkler elevation and not Building Height. Clarification and application of the highest sprinkler would appear to be more relevant for use. Building height could also be very confusing to many which could apply the finished floor elevation as the height of the building above sea level. This also coincides with the Calculation Procedure wording of 10.4.9.2 (5) which clarifies elevation of highest sprinkler. Also revise calculation form in A.10.4.4 to require "Highest Sprinkler Elevation" rather than "Building Elevation".

Submitter Information Verification

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Submittal Date: Tue Mar 11 14:07:57 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: This is the simplified calculation method. The building height is known while the height of the highest sprinkler is not known.



Public Input No. 7-NFPA 13D-2025 [Section No. 10.4.4]

10.4.4* General Pipe Sizing Method.

The following is the general pipe sizing method for straight-run systems connected to a city water main of at least 4 in. (100 mm) in diameter in accordance with 10.4.3(1):

- (1) The system flow rate shall be established in accordance with Sections 10.1 and 10.2, and it shall be determined that the flow allowed by the water meter meets or exceeds the system demand and that the total demand flow does not exceed the maximum flow allowed by the piping system components.
- (2) The water pressure in the street shall be determined.
- (3) Pipe sizes shall be selected.
- (4) * Pressure loss for a water meter, if any, shall be determined and deducted using one of the following:
 - (5) Table 10.4.4(a) shall be permitted to be used, even where the sprinkler demand flow exceeds the meter's rated continuous flow.
 - (6) Higher pressure losses specified by the manufacturer shall be used in place of those specified in Table 10.4.4(a).
 - (7) Lower pressure losses shall be permitted to be used where supporting data are provided by the meter manufacturer.
- (8) Pressure loss for elevation shall be deducted as follows:
 - (9) Building height above street (ft) $\times$ 0.433 = pressure loss (psi).
 - (10) Building height above street (m) $\times$ 0.098 = pressure loss (bar).
- (11) * Pressure losses from the city main to the inside control valve shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (12) Pressure loss for piping within the building shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).
- (13) Pressure loss for valves and fittings shall be deducted as follows:
 - (14) The valves and fittings from the control valve to the farthest sprinkler shall be counted.
 - (15) The equivalent length for each valve and fitting as shown in Table 10.4.4(b), Table 10.4.4(c), Table 10.4.4(d), Table 10.4.4(e), or as specified by the manufacturer shall be determined and the values added to obtain the total equivalent length for each pipe size.
 - (16) The equivalent length for each size shall be multiplied by the pressure loss associated with the pipe material and the values totaled.
- (17) In multilevel buildings, the steps in 10.4.4(1) through 10.4.4(8) shall be repeated to size piping for each floor.
- (18) If the remaining pressure is less than the operating pressure established by the testing laboratory for the sprinkler being used, the sprinkler system shall be redesigned.
- (19) If the remaining pressure is higher than required, smaller piping shall be permitted to be used where justified by calculations.
- (20) The remaining piping shall be sized the same as the piping up to and including the farthest sprinkler unless smaller pipe sizes are justified by calculations.

Table 10.4.4(a) Pressure Losses in psi in Water Meters

<u>Meter Size</u> <u>(in.)</u>	<u>Flow (gpm) (L/min)</u>					
	<u>18 or less</u> <u>(68)</u>	<u>23 (87)</u>	<u>26 (98)</u>	<u>31 (117)</u>	<u>39 (148)</u>	<u>52 (197)</u>
5/8 (15 mm)	9 (0.67 bar)	14 (0.97 bar)	18 (1.2 bar)	26 (1.8 bar)	38 (2.6 bar)	*
3/4 (20 mm)	7 (0.48 bar)	11 (0.76 bar)	14 (1.5 bar)	22 (1.5 bar)	35 (2.4 bar)	*_
1" (25 mm)	2 (0.14 bar)	3 (0.21 bar)	3 (0.21 bar)	4 (0.28 bar)	6 (0.41 bar)	10 (0.69 bar)
1½ (40 mm)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	2 (0.14 bar)	4 (0.28 bar)	7 (0.48 bar)
2 (50 mm)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	1 (0.07 bar)	2 (0.14 bar)	3 (0.21 bar)

For SI units, 1 gpm = 3.785 L/min; 1 in. = 25 mm; 1 psi = 0.07 bar.

*Above maximum rated flow of commonly available meters.

Table 10.4.4(b) Equivalent Length in Feet of Fittings and Valves for Schedule 40 Steel Pipe

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	12 (3.7 m)	28 (8.5 m)	15 (4.6 m)	4 (1.2 m)
1¼ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
1½ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	5 (1.5 m)	3 (0.9 m)	10 (3 m)	3 (0.9 m)	1 (0.3 m)	24 (7.3 m)	57 (17.4 m)	28 (8.5 m)	7 (2.1 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(c) Equivalent Length in Feet of Fittings and Valves for Type K Copper Tube

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
¾ (20 mm)	0	1 (0.3 m)	0	3 (0.9 m)	1 (0.3 m)	0	7 (2.1 m)	14 (4.3 m)	7 (2.1 m)	2 (0.6 m)
1 (25 mm)	1 (0.3 m)	2 (0.6 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	14 (4.3 m)	33 (10 m)	18 (5.5 m)	5 (1.5 m)
1¼ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	0	14 (4.3 m)	32 (9.8 m)	16 (4.9 m)	5 (1.5 m)
1½ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	8 (2.4 m)	3 (0.9 m)	0	18 (5.5 m)	43 (13.1 m)	22 (6.7 m)	6 (1.8 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	3 (0.9 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	28 (8.5 m)	66 (20.1 m)	33 (10 m)	8 (2.4 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(d) Equivalent Length in Feet of Fittings and Valves for Type L Copper Tube

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	8 (2.4 m)	18 (5.5 m)	10 (3 m)	3 (0.9 m)
1 (25 mm)	1 (0.3 m)	3 (0.9 m)	3 (0.9 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.6 m)	20 (6.1 m)	5 (2.1 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	6 (1.8 m)	2 (0.6 m)	0	15 (4.6 m)	35 (10.7 m)	18 (5.5 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	4 (1.2 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	20 (6.1 m)	47 (14.3 m)	24 (7.3 m)	7 (2.1 m)
2 (50 mm)	2 (0.6 m)	6 (1.8 m)	4 (1.2 m)	12 (3.7 m)	4 (1.2 m)	1 (0.3 m)	30 (9.1 m)	71 (21.6 m)	35 (10.7 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

Table 10.4.4(e) Equivalent Length in Feet of Fittings and Valves for Type M Copper Tube

<u>Diameter</u> <u>(in.)</u>	<u>45</u> <u>Degree</u> <u>Elbow</u>	<u>90</u> <u>Degree</u> <u>Elbow</u>	<u>Long-</u> <u>Radius</u> <u>Elbow</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>turned</u> <u>90</u> <u>degrees)</u>	<u>Tee or</u> <u>Cross</u> <u>(flow</u> <u>straight</u> <u>through)</u>	<u>Gate</u> <u>Valve</u>	<u>Angle</u> <u>Valve</u>	<u>Globe</u> <u>Valve</u>	<u>Globe</u> <u>"Y"</u> <u>Pattern</u> <u>Valve</u>	<u>Cock</u> <u>Valve</u>
$\frac{3}{4}$ (20 mm)	0	2 (0.6 m)	0	4 (1.2 m)	1 (0.3 m)	0	10 (3 m)	21 (6.4 m)	11 (3.3 m)	3 (0.9 m)
1 (25 mm)	2 (0.6 m)	3 (0.9 m)	3 (0.9 m)	8 (2.4 m)	3 (0.9 m)	0	19 (5.8 m)	43 (13.1 m)	23 (7 m)	6 (1.8 m)
$1\frac{1}{4}$ (32 mm)	1 (0.3 m)	3 (0.9 m)	2 (0.6 m)	7 (2.1 m)	2 (0.6 m)	0	16 (4.9 m)	38 (11.5 m)	20 (6.1 m)	5 (1.5 m)
$1\frac{1}{2}$ (40 mm)	2 (0.6 m)	5 (1.5 m)	2 (0.6 m)	9 (2.7 m)	3 (0.9 m)	0	21 (6.4 m)	50 (15.2 m)	26 (7.9 m)	7 (2.1 m)
2 (50 mm)	3 (0.9 m)	7 (2.1 m)	4 (1.2 m)	13 (4 m)	5 (1.5 m)	1 (0.3 m)	32 (9.8 m)	75 (22.9 m)	37 (11.3 m)	9 (2.7 m)

For SI units, 1 in. = 25 mm; 1 ft = 0.3048 m.

Statement of Problem and Substantiation for Public Input

Table 10.4.4(a) is missing the Meter size of 1". It has resulting values, but the size of meter is missing. Resolving this would clarify the intent of the adjacent values.

Submitter Information Verification

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Submittal Date: Tue Mar 11 14:26:54 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: [FR-17-NFPA 13D-2025](#)

Statement: Information for a 1" (25 mm) meter was left out of Table A in the last edition. A missing closing parentheses was added to Table B.



Public Input No. 36-NFPA 13D-2025 [Section No. 12.1]

12.1* General.

The installer shall provide to the owner ~~occupant instructions~~ or owner's representative instructions on inspecting, testing, and maintaining the system.

Statement of Problem and Substantiation for Public Input

The practicality of providing these instructions to the occupant is difficult.

Submitter Information Verification

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Submittal Date: Wed May 28 12:01:35 EDT 2025

Committee: AUT-RSS

Committee Statement

Resolution: FR-18-NFPA 13D-2025

Statement: The practicality of providing these instructions to the occupant is difficult. Upon completion of the project, the occupant may not yet be determined.



Public Input No. 27-NFPA 13D-2025 [Section No. A.1.1]

A.1.1



This standard is appropriate for protection against fire hazards only in one- and two-family dwellings and manufactured homes. A one- and/or two-family dwelling that is used as a rental property could still be appropriate to be protected with a system installed in accordance with NFPA 13D. Residential portions of any other type of building occupancy or within mixed occupancies should be protected with sprinklers in accordance with NFPA 13 or NFPA 13R. ~~Nonresidential portions of such buildings should be protected in accordance with NFPA 13 or NFPA 13R as appropriate for areas outside the dwelling unit.~~

The criteria in this standard are based on full-scale fire tests of rooms containing typical furnishings found in residential living rooms, kitchens, and bedrooms. The furnishings were arranged as typically found in dwelling units in a manner similar to that shown in Figure A.1.1(a), Figure A.1.1(b), and Figure A.1.1(c). Sixty full-scale fire tests were conducted in a two-story dwelling in Los Angeles, California, and 16 tests were conducted in a 14 ft (4.2 m) wide mobile home in Charlotte, North Carolina.

Sprinkler systems designed and installed according to this standard are expected to prevent flashover within the compartment of origin where sprinklers are installed in the compartment. A sprinkler system designed and installed according to this standard cannot, however, be expected to completely control a fire involving fuel loads that are significantly higher than average for dwelling units [10 lb/ft^2 (49 kg/m^2)] and where the interior finish exhibits either a high flame spread index (greater than 200, corresponding to a Class C) when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or UL 723, *Test for Surface Burning Characteristics of Building Materials*, or a high heat release (such as a heat release rate exceeding 800 kW) when tested in accordance with NFPA 286.

(For protection of multifamily dwellings, see NFPA 13 or NFPA 13R.)

Figure A.1.1(a) Bedroom.

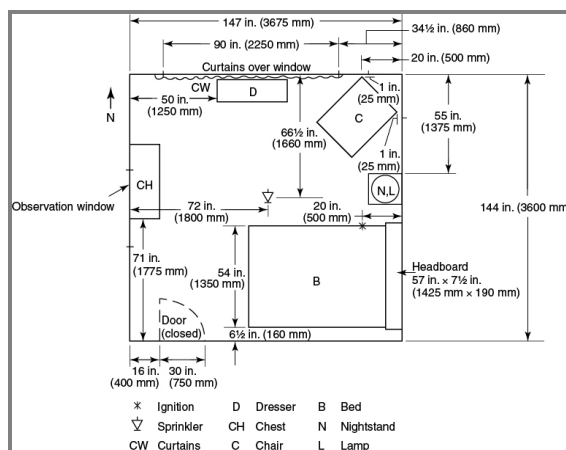


Figure A.1.1(b) Manufactured Home Bedroom.

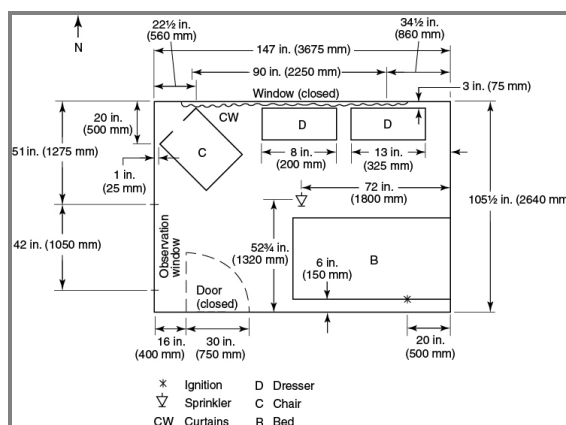
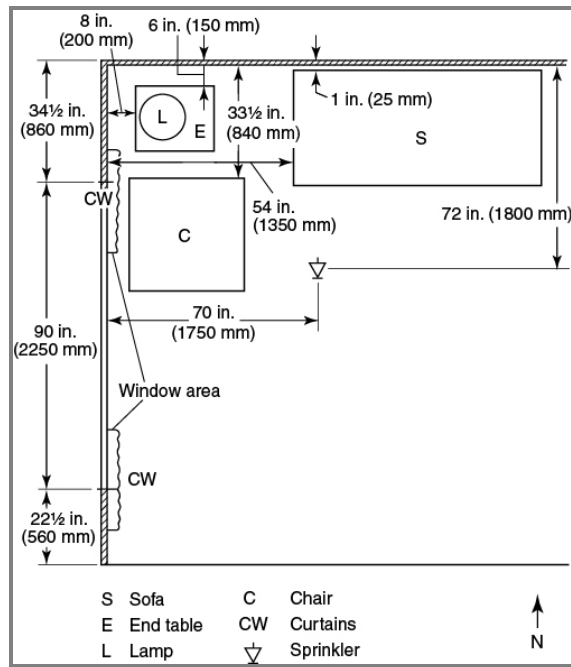


Figure A.1.1(c) Living Room.



Statement of Problem and Substantiation for Public Input

Based on the scope of NFPA 13D, any portion of a one- and two-family dwelling, manufactured house or townhouse would be considered part of the residential portions of the building. The statement on nonresidential portions in NFPA 13D is not needed and should be removed to avoid any confusion.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 25-NFPA 13D-2025 [Section No. 8.1.2]	
Public Input No. 26-NFPA 13D-2025 [Section No. 8.2.3]	

Submitter Information Verification

Submitter Full Name: Steven Orlowski
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Submittal Date: Wed May 28 08:48:28 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: [FR-1-NFPA 13D-2025](#)

Statement: The reference to NFPA 13 could lead an AHJ to require protection that NFPA 13D does not require. Ambiguous language has been removed.



Public Input No. 15-NFPA 13D-2025 [Section No. A.8.2.6]

[Add Figure A.8.2.6 (c) Dry Sidewall Sprinkler Through Wall]

[Add Figure A.8.2.6(d) Dry Pendent Sprinkler Through Ceiling]

A.8.2.6

Dry sprinklers must be of sufficient length to avoid freezing of the water-filled pipes due to conduction along the barrel. The values of exposed barrel length in Table 8.2.6.1(a) and Table 8.2.6.1(b) have been developed using an assumption of a properly sealed penetration and an assumed maximum wind velocity on the exposed sprinkler of 30 mph (48 km/h). Where higher wind velocity is expected, longer exposed barrel lengths will help avoid freezing of the wet piping. The total length of the barrel of the dry sprinkler must be longer than the values shown in Table 8.2.6.1(a) and Table 8.2.6.1(b) because the length shown in the tables is the minimum length of the barrel that needs to be exposed to the warmer ambient temperature in the heated space. See Figure A.8.2.6(a) for examples of where to measure the exposed barrel length for a sidewall sprinkler penetrating an exterior wall and Figure A.8.2.6(b) for an example of where to measure the exposed barrel length for a pendent sprinkler penetrating a ceiling or top of an insulated structure.

Figure A.8.2.6(a) Dry Sidewall Sprinkler Through Wall.

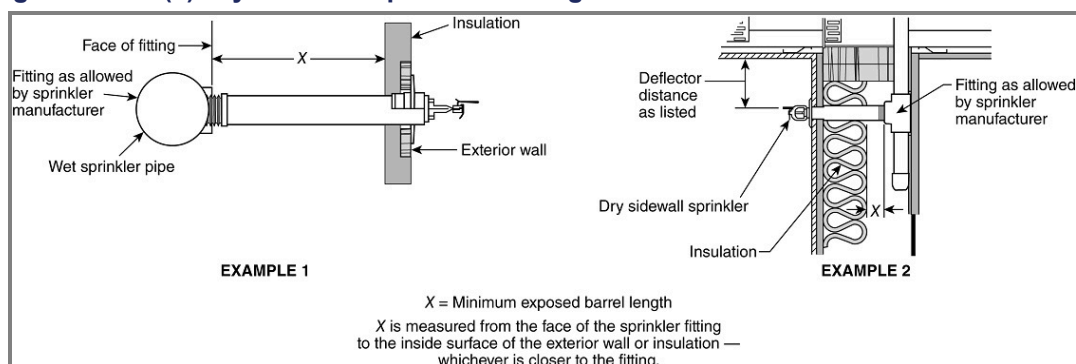
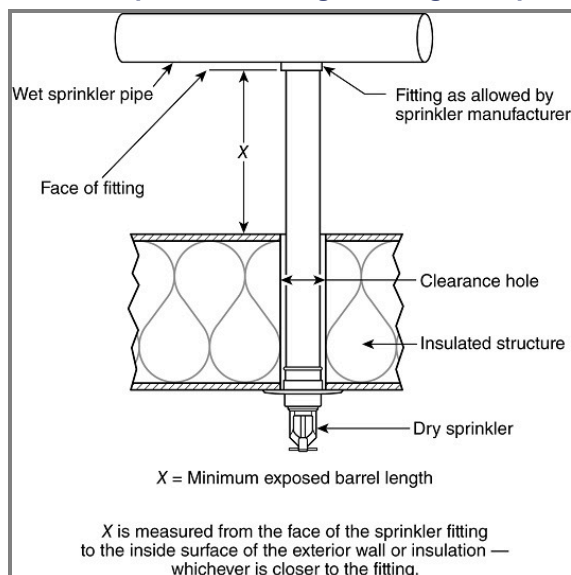


Figure A.8.2.6(b) Dry Pendent Sprinkler Through Ceiling or Top of Insulated Structure.



Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Dry_Sidewall_Sprinkler_Through_Wall.jpeg	Figure A.8.2.6(c)	
Dry_Pendent_Sprinkler_Through_Ceiling_or_Top_of_Freezer.jpeg	Figure A.8.2.6(d)	

Statement of Problem and Substantiation for Public Input

Additional figures for measuring dry barrel lengths on dry flexible sprinkler hoses should be added to correlate with NFPA 13

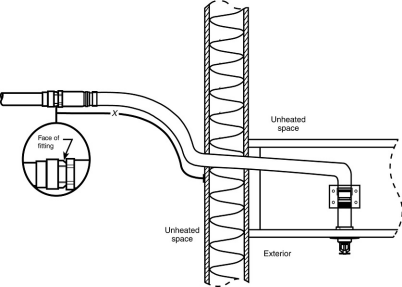
Submitter Information Verification

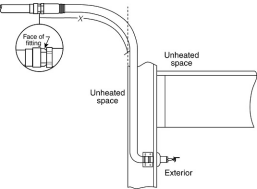
Submitter Full Name: Kevin Hall
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Submittal Date: Fri May 23 17:03:24 EDT 2025
Committee: AUT-RSS

Committee Statement

Resolution: [FR-19-NFPA 13D-2025](#)

Statement: There are 2 additional figures in NFPA 13 and NFPA 13R that apply to NFPA 13D for measuring Dry Sidewall sprinklers (Figure A.15.3.1(c) Dry Sidewall Sprinkler Through Wall and Figure A.15.3.1(d) Dry Pendent Sprinkler Through Ceiling from NFPA 13). These should be added to NFPA 13D.







Public Input No. 47-NFPA 13D-2025 [Section No. A.8.2.6]

A.8.2.6

Add Figure **Figure A.15.3.1(c)** *Dry Sidewall Sprinkler Through Wall* and **Figure A.15.3.1(d)** *Dry Pendent Sprinkler Through Ceiling from NFPA 13* - See uploaded document

Dry sprinklers must be of sufficient length to avoid freezing of the water-filled pipes due to conduction along the barrel. The values of exposed barrel length in Table 8.2.6.1(a) and Table 8.2.6.1(b) have been developed using an assumption of a properly sealed penetration and an assumed maximum wind velocity on the exposed sprinkler of 30 mph (48 km/h). Where higher wind velocity is expected, longer exposed barrel lengths will help avoid freezing of the wet piping. The total length of the barrel of the dry sprinkler must be longer than the values shown in Table 8.2.6.1(a) and Table 8.2.6.1(b) because the length shown in the tables is the minimum length of the barrel that needs to be exposed to the warmer ambient temperature in the heated space. See Figure A.8.2.6(a) for examples of where to measure the exposed barrel length for a sidewall sprinkler penetrating an exterior wall and Figure A.8.2.6(b) for an example of where to measure the exposed barrel length for a pendent sprinkler penetrating a ceiling or top of an insulated structure.

Figure A.8.2.6(a) Dry Sidewall Sprinkler Through Wall.

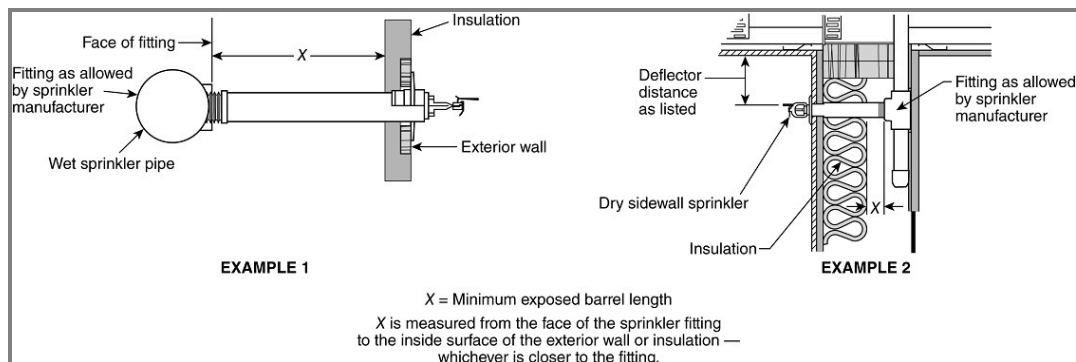
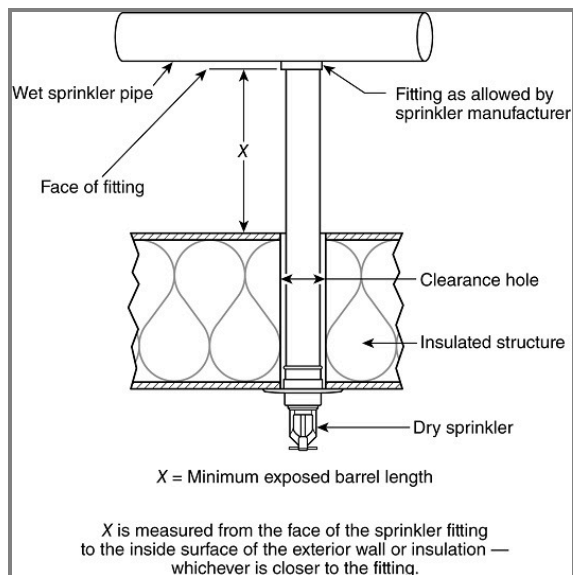


Figure A.8.2.6(b) Dry Pendent Sprinkler Through Ceiling or Top of Insulated Structure.



Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Dry_figures.docx	Dry Figures	

Statement of Problem and Substantiation for Public Input

There are 2 additional figures in NFPA #13 and NFPA #13R that apply to NFPA #13D for measuring Dry Sidewalls (Figure A.15.3.1(c) Dry Sidewall Sprinkler Through Wall and Figure A.15.3.1(d) Dry Pendent Sprinkler Through Ceiling from NFPA 13 - See uploaded document). These should be added to NFPA #13D. Figure A.15.3.1(c) Dry Sidewall Sprinkler Through Wall and Figure A.15.3.1(d) Dry Pendent Sprinkler Through Ceiling from NFPA 13 - See uploaded document

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Committee Statement

Resolution: FR-19-NFPA 13D-2025

Statement: There are 2 additional figures in NFPA 13 and NFPA 13R that apply to NFPA 13D for measuring Dry Sidewall sprinklers (Figure A.15.3.1(c) Dry Sidewall Sprinkler Through Wall and Figure A.15.3.1(d) Dry Pendent Sprinkler Through Ceiling from NFPA 13). These should be added to NFPA 13D.



Public Input No. 37-NFPA 13D-2025 [Section No. D.1.2.6]

D.1.2.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

CAN/UL/ULC 199, *Automatic Sprinklers for Fire-Protection Service*, ~~2022~~ 2025 .

UL 723, *Test for Surface Burning Characteristics of Building Materials*, 2018.

UL 1626, *Residential Sprinklers for Fire-Protection Service*, 2008, revised 2018.

Statement of Problem and Substantiation for Public Input

Update of UL references to the document.

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