



30.1 General.

30.1.1

In addition to the applicable requirements of this standard, the requirements of Chapter 30 shall apply where modifications, evaluations, or additions are made to existing systems.

30.1.2 *

Existing systems shall be subject to the retroactivity requirements of Section 1.4.

30.1.3

Where additions or modifications are made to an existing system, enough of the existing system shall be indicated on the plans to make all conditions clear.

30.1.4 *

When backflow prevention devices are to be retroactively installed on existing systems, a hydraulic analysis, including revised hydraulic calculations, new fire flow data, and all modifications to accommodate the additional friction loss, shall be completed as a part of the installation.

30.1.5

Where existing system modifications include added or relocated sprinklers, or flexible sprinkler hose fittings are retroactively installed on existing systems, a hydraulic analysis or revised hydraulic calculations using current water supply data to accommodate the additional friction loss shall be completed as a part of the installation.

30.1.6

A hydraulically calculated system for a building, or a hydraulically calculated addition to a system in an existing sprinklered building using the pipe schedule method, shall supersede the requirements in this standard governing pipe schedules, except that all systems shall continue to be limited by area.

30.1.7

Unless permitted by 30.1.7.1, when modifying existing systems protecting general storage, rack storage, rubber tire storage, roll paper storage, and baled cotton storage, using sprinklers with K-factors K-8.0 (115) or less, the requirements of 21.1.3 and 21.1.4 shall not apply.

30.1.7.1

Where applying the requirements of Table 21.5.1.1 utilizing the design criteria of 0.6 gpm/ft² per 2000 ft² (25.5 mm/min over 185 m²) to existing storage applications, standard-response spray sprinklers with a K-factor of K-11.2 (160) or larger that are listed for storage applications shall be used.

30.1.8

For modifications or additions to existing systems equipped with residential sprinklers, the listed discharge criteria less than 0.1 gpm/ft² (4.1 mm/min) shall be permitted to be used.

30.1.9 *

When nitrogen is retroactively applied to existing dry pipe or double interlock preaction systems previously having a compressed air supply, a Hazen-Williams C-factor of 100 shall be applied.

30.1.10

Torch cutting and welding shall not be permitted as a means of modifying or repairing sprinkler systems.

30.1.11

Additives to existing systems intended for control of microbiological or other corrosion shall be listed for use within fire sprinkler systems.

30.2 Components.

30.2.1

The use of reconditioned valves and devices as replacement equipment in existing systems shall be permitted.

30.2.2

Where all or part of an inactive sprinkler system is abandoned in place, components including sprinklers, hose valves and hoses, and alarm devices shall be removed.

30.2.3

Control valves abandoned in place shall have the operating mechanisms removed.

30.2.4

Sprinkler system piping and/or valves abandoned in place shall be uniquely identified to differentiate them from active system piping and valves.

30.3 Sprinklers.**30.3.1**

Reconditioned sprinklers shall not be permitted on any existing system.

30.3.2

When a threaded sprinkler is removed from a fitting or welded outlet, it shall not be reinstalled except as permitted by 30.3.2.1. (See A.16.2.1.1.)

30.3.2.1

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

30.3.3

Where modifications or additions are made to existing light hazard systems equipped with standard response sprinklers, new standard response sprinklers shall be permitted to be used.

30.3.4

Where individual standard response sprinklers are replaced in existing light hazard systems, new standard response sprinklers shall be permitted to be used.

30.3.5

Where existing light hazard systems are converted to use quick-response or residential sprinklers, all sprinklers in a compartment shall be changed.

30.3.6

When replacing residential sprinklers manufactured prior to 2003 that are no longer available from the manufacturer and that 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.

30.3.7

Where cover plates on concealed sprinklers have been painted by other than the sprinkler manufacturer, the cover plates shall be replaced.

30.3.8

Sprinklers having a K-factor exceeding K-5.6 (80) and having ½ in. (15 mm) National Pipe Thread (NPT) shall be permitted to be installed in existing sprinkler systems if listed for such use.

30.4 * Evaluation of Existing Systems. (AUT-SSD)**30.4.1 * General.**

Where changes in the occupancy, hazard, water supply, storage commodity, storage arrangement, building modification, or other condition that affects the installation criteria of the system are identified, the existing system shall be evaluated based on the current hazard and water supply.

30.4.2 * Evaluation.

Evaluation of existing systems shall be in accordance with one of the following methods:

- (1) As a new system in accordance with this edition of the standard
- (2) In accordance with the edition of NFPA 13 utilized in the design and installation of the system

30.5 Modification of Existing Systems.**30.5.1 Revamping of Pipe Schedule Systems.****30.5.1.1**

The pipe schedule method shall be permitted as follows:

- (1) Additions or modifications to existing pipe schedule systems sized according to the pipe schedules of Section 28.5
- (2) Additions or modifications to existing extra hazard pipe schedule systems sized according to the extra hazard pipe schedule in Table 30.5.1.1

Table 30.5.1.1 Extra Hazard Pipe Schedule

Steel			Copper		
Size			Size		
in.	mm	Number of Sprinklers	in.	mm	Number of Sprinklers
1	25	1	1	25	1
1 $\frac{1}{4}$	32	2	1 $\frac{1}{4}$	32	2
1 $\frac{1}{2}$	40	5	1 $\frac{1}{2}$	40	5
2	50	8	2	50	8
2 $\frac{1}{2}$	65	15	2 $\frac{1}{2}$	65	20
3	80	27	3	80	30
3 $\frac{1}{2}$	90	40	3 $\frac{1}{2}$	90	45
4	100	55	4	100	65
5	125	90	5	125	100
6	150	150	6	150	170

30.5.2 Revamping of Hydraulic Design Systems.**30.5.2.1**

When hydraulically designed systems are revamped, any existing bushing shall be removed and a nipple not exceeding 4 in. (100 mm) in length shall be permitted to be installed in the branch line fitting.

30.5.2.2 *

Calculations shall be provided to verify that the system design flow rate will be achieved.

30.5.2.3

When it is necessary to pipe two new ceiling sprinklers from an existing outlet in an overhead system, any bushings shall be removed and the use of a nipple not exceeding 4 in. (100 mm) in length and of the same pipe thread size as the existing outlet shall be permitted, provided that a hydraulic calculation verifies that the design flow rate will be achieved.

30.5.2.4

Where an armover is attached to connect to a sprinkler, the use of pipe nipples less than 1 in. (25 mm) in diameter shall not be permitted where seismic design is required on the system.

30.5.3

When pipe schedule systems are revamped to accommodate added ceilings, sprinkler outlets utilized for new armover or drop nipples shall have hexagonal bushings removed when present.

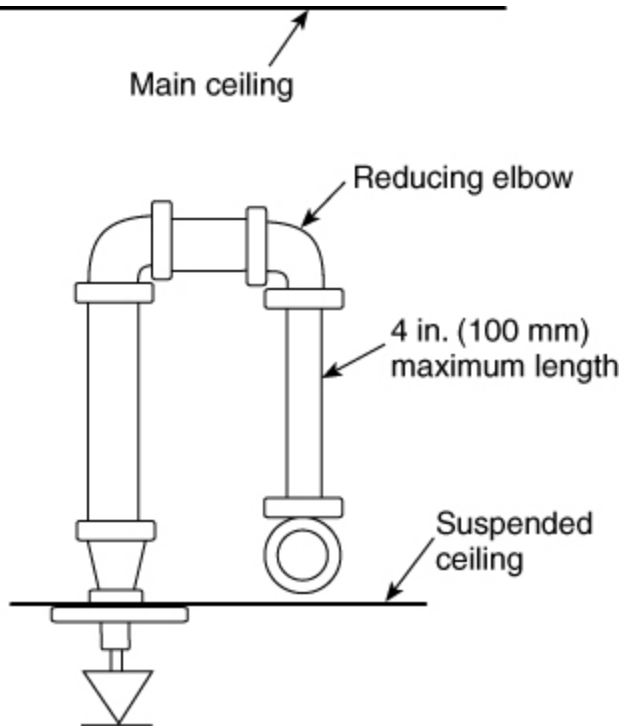
30.5.4

When pipe schedule systems are revamped, a nipple not exceeding 4 in. (100 mm) in length shall be permitted to be installed in the branch line fitting.

30.5.5

All piping other than the nipple permitted in 30.5.4 and 30.5.6 shall be a minimum of 1 in. (25 mm) in diameter in accordance with Figure 30.5.5.

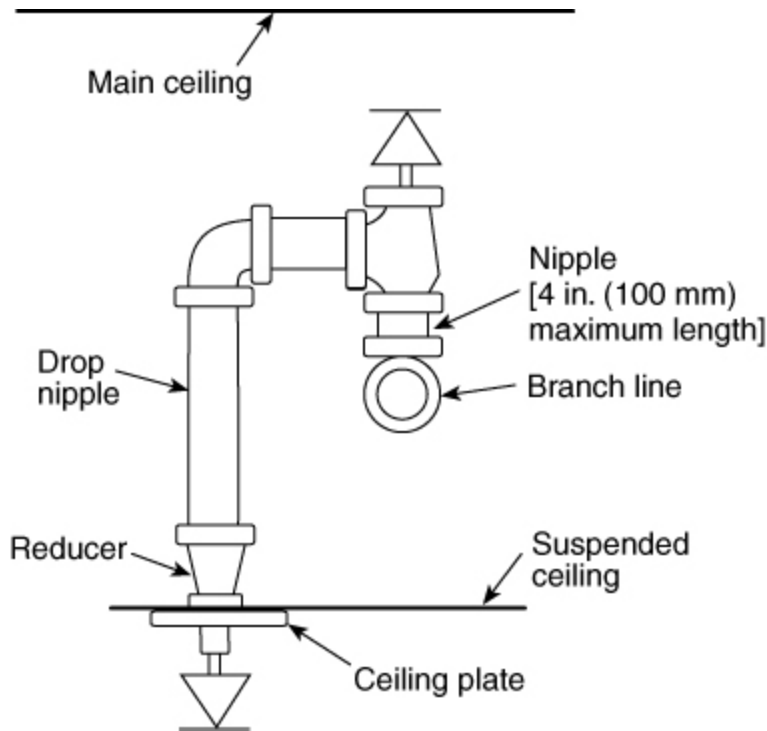
Figure 30.5.5 Nipple and Reducing Elbow Supplying Sprinkler Below Ceiling.



30.5.6

When it is necessary to pipe two new ceiling sprinklers from an existing outlet in an overhead system, the use of a nipple not exceeding 4 in. (100 mm) in length and of the same pipe thread size as the existing outlet shall be permitted in accordance with Figure 30.5.6, provided that a hydraulic calculation verifies that the design flow rate will be achieved.

Figure 30.5.6 Sprinklers in Concealed Space and Below Ceiling.



30.5.7

Where an armover is attached to connect to a sprinkler, the use of pipe nipples less than 1 in. (25 mm) in diameter shall not be permitted where seismic design is required on the system.

30.6 System Design.

30.6.1

Where an addition or modifications are made to an existing system, enough of the existing system shall be indicated on the plans to make all conditions clear.

30.6.2

The pipe schedule method shall be permitted as follows:

- (1) For modifications or additions to existing systems equipped with residential sprinklers, the listed discharge criteria less than 0.1 gpm/ft² (4.1 mm/min) shall be permitted to be used.
- (2) A hydraulically calculated system for a building, or a hydraulically calculated addition to a system in an existing sprinklered building using the pipe schedule method, shall supersede the rules in this standard governing pipe schedules, except that all systems shall continue to be limited by area.
- (3) Unless permitted by 30.6.3, when modifying existing systems protecting general storage, rack storage, rubber tire storage, roll paper storage, and baled cotton storage, using sprinklers with K-factors K-8.0 (115) or less, the requirements of 30.6.2 and 30.6.3 shall not apply.

30.6.3

Where applying the requirements of Figure 25.4.2.4.1(c) and Figure 25.4.2.4.1(d) utilizing the design criteria of 0.6 gpm/ft² per 2000 ft² (25.5 mm/min over 185 m²) to existing storage applications, standard-response spray sprinklers with a K-factor of K-11.2 (K-161) or larger that are listed for storage applications shall be used.

30.6.4

For modifications or additions to existing systems equipped with residential sprinklers, the listed discharge criteria less than 0.1 gpm/ft² (4.1 mm/min) shall be permitted to be used.

30.6.5

For modifications to existing systems equipped with ESFR sprinklers where ESFR sprinklers are used for the protection of light or ordinary hazard occupancies, 30.6.5.1 through 30.6.5.3 shall be permitted.

30.6.5.1

In light hazard occupancies, the protection area limitations of ESFR sprinklers shall be permitted to meet the protection area requirements of Table 10.2.4.2.1(a).

30.6.5.2

In light and ordinary hazard occupancies, the sprinkler spacing of ESFR sprinklers shall be permitted to meet the sprinkler spacing requirements of 10.2.5.

30.6.5.3

In light and ordinary hazard occupancies, the obstruction to the sprinkler discharge pattern of ESFR sprinklers shall be permitted to meet the obstruction discharge requirements of 10.2.7.2.

30.6.6

When backflow prevention devices are to be retroactively installed on existing systems, a thorough hydraulic analysis, including revised hydraulic calculations, new fire flow data, and all necessary system modifications to accommodate the additional friction loss, shall be completed as a part of the installation.

30.6.7

A hydraulically calculated system for a building, or a hydraulically calculated addition to a system in an existing sprinklered building using the pipe schedule method, shall supersede the rules in this standard governing pipe schedules, except that all systems shall continue to be limited by area.

30.6.8

Unless permitted by 30.6.3, when modifying existing systems protecting general storage, rack storage, rubber tire storage, roll paper storage, and baled cotton storage, using sprinklers with K-factors K-8.0 (115) or less, the requirements of 21.1.3 and 21.1.4 shall not apply.

30.6.9

A Hazen-Williams C-factor of 100 shall be used in hydraulic calculations for modifications or additions when nitrogen is retroactively applied to existing dry pipe or double interlock preaction systems previously having a compressed air supply.

30.7 Testing.**30.7.1**

Modifications to existing piping systems shall be isolated and hydrostatically tested in accordance with 29.2.1.

30.7.1.1

Where modifications affect 20 sprinklers or less, the new portion shall be hydrostatically tested at system working pressure.

30.7.1.2

Regardless of the number of sprinklers affected, modifications that cannot be isolated shall be hydrostatically tested at system working pressure.

30.7.1.3

Modifications to deluge systems shall be permitted to be flow tested in lieu of hydrostatic testing, to verify all the following:

- (1) Water discharge patterns from all the open spray nozzles or sprinklers
- (2) Adequate coverage of wetting surfaces to be protected
- (3) Design pressure at the most remote nozzle or sprinkler
- (4) Design pressure at the deluge valve

30.7.2

Modifications to existing dry pipe or double interlock preaction systems shall be tested for air leakage using one of the following test methods:

- (1) An air pressure test at 40 psi (2.7 bar) shall be performed for 2 hours as follows:
 - (a) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test.
 - (b) Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
- (2) With the system at normal system air pressure, the air source shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed.