

NFPA 13R

1.1

1.1 Scope

This standard covers the design and installation of automatic sprinkler systems for protection against fire hazards in residential occupancies up to and including ~~two~~ four stories in height. Residential occupancies three or more stories in height shall be protected throughout in accordance with NFPA 13.

When sprinkler protection is being provided to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access for single-family residential occupancies, the minimum design criteria shall be as outlined in Section 7.5 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC.

5.1.3

5.1.3 Rated Pressure. System components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 175 psi (12.1 bar) for components installed aboveground and 150 psi (10.4 bar) for components installed underground. When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 200), or 50 psi greater than the system design pressure, whichever is greater.

5.2.1

5.2.1 Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.1 or in accordance with 5.2.2. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

6.4.4

6.4.4 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, provided the installation conforms to a modification or alternative materials and methods report that has been approved by the authority having jurisdiction.

6.6.4

6.6.4 Sprinklers shall be installed in any closet used for heating and air-conditioning equipment ~~except as permitted by 6.6.7~~ or containing fuel-fired equipment

6.6.5

6.6.5 Sprinklers shall not be required in any porches, balconies, corridors, and stairs that are open and attached, unless specifically required in any of these areas by the Building Code and/or Fire Code.

6.6.6.1

6.6.6.1 Protection of Fuel-Fired Equipment. When fuel-fired equipment is present, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment. Where protection of fuel-fired equipment is required by 6.6.4, 6.6.6 and 6.6.7, sprinkler protection shall be provided in accordance with the following:

- (1) At least one quick-response sprinkler with a minimum k-factor of 5.6 shall be provided above the fuel-fired equipment. Sprinklers shall be sufficient to cover the fuel-fired equipment protection area, which is equal to the entire perimeter of the fuel-fired equipment when viewed on a plan view.
- (2) Where the sprinkler(s) protecting the fuel-fired equipment is located under a ceiling with slope equal to or greater than a 4:12 pitch, a minimum of one sprinkler shall be located above the edge of the fuel-fired equipment protection area, on the upslope side of the equipment.
- (3) Freeze protection shall be provided in accordance with 5.4.2.

6.6.7

6.6.7 Sprinklers shall not be required in closets (regardless of size) on exterior balconies and exterior breezeways/corridors, regardless of size, as long as the closet does not have doors or unprotected penetrations directly into the dwelling unit, and as long as the closet does not contain fuel-fired equipment.

6.7.2.2.2

6.7.2.2.2 Where water supplies are known to have unusual corrosive properties and threaded or cut-groove steel pipe is to be used, wall thickness shall be in accordance with Schedule 30 [in sizes 8 in. (200 mm) or larger] or Schedules 40 [in sizes less than 8 in. (200 mm)]. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

6.8.2

6.8.2 The sprinkler system piping shall not have a separate control valve installed unless supervised by ~~a one~~ 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~~

6.15

~~**6.15 Drop-Out Ceilings.** Drop-out ceilings shall be permitted to be installed beneath sprinklers where ceilings are listed for that service and are installed in accordance with their listings.~~

7.1.1.4

7.1.1.4 Systems installed in accordance with the single family residential protection matrix (Section 7.5) shall not require monitoring.

7.5

7.5 Protection Matrix for Group R Division 3 Occupancies. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 7.5 shall be applied.

Table 7.5 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC⁴

Building Area SIZE RANGE ⁶	Mitigation Residential SYSTEM TYPE ^{1,3}	SEPARATE SPRINKLER LEAD-IN REQUIRED ⁵	MINIMUM UNDERGROUND PIPE SIZE ⁵	MINIMUM WATER SIZE ⁵	METER	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
< 3,600 sq.ft.	Standard NFPA 13D ²	See NFPA 13D for design requirements (section 8.7)				
≥ 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D ^{1,2}	See NFPA 13D for design requirements (section 8.7)				
≥ 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R ¹	Yes	N/A	N/A		Yes
≥ 15,000 sq.ft.	Modified NFPA 13 ¹	See NFPA 13 for design requirements (section 21.37)				

N/A = Not Applicable

1. This mitigation constitutes a building "protected with an approved fire sprinkler system" per the IFC.
2. Domestic demand of 5 gpm is required to be added to the sprinkler demand in the hydraulic calculations.
3. Free-standing detached buildings with one or more sleeping rooms shall be protected by an Enhanced NFPA 13D system.
4. Excluding Group Care Homes.
5. U.G. lead-in shall be the minimum size required hydraulically as proven by the sprinkler contractor and shall be hydrostatically tested and flushed, witnessed by the fire dept.
6. Building area is defined as all areas under roof except for porches, patios, balconies, carports and porte cocheres.

7.5.1 Enhanced 13R Design. When Table 7.5 requires an Enhanced 13R design, the sprinkler system shall be designed and installed in accordance with NFPA 13R, except that sprinklers shall be installed throughout the structure except where omissions are permitted by the following:

1. Unheated attic spaces that do not contain fuel fired equipment.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.

7.5.2 Other Protection Designs. For other protection designs listed in Table 7.5, see the respective revised codes for NFPA 13 and NFPA 13D minimum design requirements.

8.1.7

8.1.7 Sprinkler plans shall indicate the following:

1. Name of owner and occupant.
2. Location, including street address.
3. Point of compass.
4. Ceiling construction.
5. Full height cross section.
6. Ceiling/roof heights and slopes not shown in the full height cross section.
7. Location of fire walls.
8. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
9. Occupancy, label, and name of all each areas or rooms.
10. Location and size of concealed spaces, attics, closets, and bathrooms.
11. Any small enclosures in which no sprinklers are to be installed.
12. Size of city main in street; pressure; whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main; and city main test results including elevation of the test hydrant.
13. Make, manufacturer, model, type, heat-response element, temperature rating, nominal K-factor, number of sprinklers installed, and nominal orifice size of the sprinkler, including sprinkler identification number.
- ~~14. Temperature rating and location of high temperature sprinklers~~
- ~~15. Number of sprinkler on each riser, per floor~~
14. Type Kind and location of alarm bells horn/strobes.
15. Type of pipe and fittings.
16. Pipe type and schedule of wall thickness.
17. Type of protection for nonmetallic pipe.
18. Nominal pipe size with lengths shown to scale.
19. Location and size of riser nipples.
20. Type of fittings and joints and the location of all welds and bends.
21. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable.
22. All control valves, check valves, drain pipes, and test connections.
23. Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
24. In case of hydraulically designed systems, the information on the hydraulic data nameplate.
25. Name, and address, phone number, and contractor's license number of sprinkler contractor.
26. Nevada State Fire Marshal registration number.
27. Signature and NICET number, or engineer's seal, of the designer.
28. General notes as required by the AHJ.
29. Approximate capacity in gallons of each dry pipe system.
30. Make, type, model, and size of alarm or dry pipe valve.
31. Piping provisions for flushing.
32. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
33. A graphic representation of the scale used on all plans.
34. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
35. The minimum rate of water application (density or flow or discharge pressure), the design area of water application, and the domestic demand.
36. The total quantity of water and the pressure required noted at a common reference point for each system.
37. Relative elevations of sprinklers, junction points, and supply or reference points.
38. Information about backflow preventers (manufacturer, size, type).
39. Information about antifreeze solution used (type and amount).

40. Size and location of hydrants, showing size and number of outlets. Static and residual hydrants that were used in flow tests shall be shown.
41. Size, location, and piping arrangement of fire department connections.
42. Location of fuel-fired equipment and heating and air-conditioning equipment.
43. Location of closets on exterior balconies, and a note indicating whether there is any type of door or penetration between the closet and the dwelling unit.
44. Edition year of NFPA 13R to which the sprinkler system is designed.
45. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.