

**13R Residential Sprinkler System
Plan Review Worksheet**
2006 IFC, 2002 NFPA 13, and 2002 NFPA 13R

Date of Review: _____ Permit Number: _____
 Business/Building Name: _____ Address of Project: _____
 Designer Name: _____ Designer's Phone: _____
 Contractor: _____ Contractor's Phone: _____
 No. of Sprinklers: _____ Occupancy Classification: _____

Reference numbers following worksheet statements represent an NFPA code section unless otherwise specified.

Worksheet Legend: ✓ or OK = acceptable N = need to provide, NA = not applicable

1. _____ Three sets of drawings are provided. The plans declare the design standard is the 2002 edition year of NFPA 13R.
2. _____ System components are listed for intended use and compatible with the system, and equipment data sheets are provided.

Drawings shall detail the following:

General:

3. _____ The type of system is noted: ___ wet, ___ dry, ___antifreeze not exceeding 40 gals., ___ preaction, and type of sprinklers are noted: ___pendent, ___upright, ___sidewall, 5.3.2.
4. _____ Scale: a common scale shall be used and plan information is legible, 6.1.
5. _____ Plot plan showing supply piping and pipe size from the water source to the building, 6.1.
6. _____ Building dimensions, location of partitions, and fire walls, 6.1.
7. _____ Room dimensions, labeled rooms, occupancy class of each room, 6.1.
8. _____ Full height cross elevation views and include ceiling construction, 6.1.
9. _____ Type of protection for nonmetallic pipe, 6.1.
10. _____ Dimensions for system piping, type of pipe, and component spacing, 6.1.
11. _____ Equipment symbol legend and the North orientation arrow, 6.1.
12. _____ A water flow alarm and test connection are provided, 6.4.3 and 6.6.8.
13. _____ All water supply valves and flow switches are supervised, IFC 903.4.
14. _____ Exterior flow alarm location is shown and the type identified, if electric, it is listed for outdoor use, IFC 903.4.2., and it is connected to the building fire alarm, if provided, 6.6.8.
15. _____ Backflow prevention device, when required, is shown in the pipe schematic, listed specification sheet and pressure loss data is provided, IFC 903.3.5.
16. _____ Antifreeze systems are detailed and designed in accordance with NFPA 13: 7.5.
17. _____ The system demand has at least 30 minutes of water supply, 6.5.2.
18. _____ If a fire pump is required it is designed and detailed in accordance with NFPA 20 and this book's worksheet, 6.5.4.
19. _____ Pressure gauges are provided and detailed for supply and system pressure, 6.6.5.

Sprinklers:

20. _____ Total number of each type of sprinkler is noted and the number of sprinklers per floor are noted, 6.1.
21. _____ Sprinkler location is correct, ceiling and roof sectionals are provided for clarification.
22. _____ Type of sprinklers: sprinkler K-factors, temperature rating, and orifice size, 6.1.
23. _____ Residential sprinklers are limited for use for wet pipe automatic sprinkler systems unless specifically listed for another use, 6.6.7.
24. _____ When listed quick-response sprinklers are used in dwelling units, the dwelling unit shall meet the definition of a compartment and a maximum of four sprinklers are used. The sprinkler density complies with 6.6.7.1.3.
25. _____ Sprinklers are rated for ordinary temperature (135°F-175°F) when ceiling temperature does not exceed 100°F, 6.6.7.1.5.
26. _____ Sprinklers in areas with a ceiling temperature of 101°F-150°F are equipped with intermediate temperature sprinklers (175°F-225°F), 6.6.7.1.5.

Fire Plan Review and Inspection Guidelines

27. _____ Distance of sprinklers from heat sources complies with Table 6.6.7.1.5.3.
28. _____ Quick-response sprinklers are used when protection is on the outside a dwelling unit, 6.6.7.2.
29. _____ Each sprinkler coverage area is within its listing limitations, 6.6.7.
30. _____ Residential sprinklers without a listed coverage criteria: Sprinkler separation is a maximum of 12 ft. and a maximum of 6 ft. from the wall unless the listing states otherwise, 6.7.1.3.1.2 and 6.7.1.3.1.3.
31. _____ Residential sprinklers without a listed coverage criteria: Sprinkler separation is a minimum of 8 ft. within a compartment unless the listing states otherwise, 6.7.1.3.1.4.
32. _____ Sidewall sprinklers distance from the ceiling complies with 6.7.1.5.2.1.
33. _____ A single sprinkler at the highest ceiling level can provide coverage for closets and storage areas not exceeding 300 cu. ft. and the lowest point of the ceiling height is 5 ft., 6.7.1.5.4.
34. _____ Sprinklers are not required in noncombustible dwelling unit bathrooms where the area and the walls and ceiling meet the construction requirements of 6.8.2.
35. _____ Sprinklers are not required in dwelling unit clothes closets, pantries, or linen closets, provided the closet area, its least dimension, and its method of construction complies with 6.8.3.
36. _____ Sprinkler protection for open and attached porches, balconies, corridors, and stairs are not required, 6.8.4. If the building construction is of Type V balconies and decks require sprinkler protection in accordance with IFC Section 903.3.1.2.1.
37. _____ Sprinklers are not required for areas not used for living purposes or used for storage as listed in 6.8.5.

Pipe Support and Hangers are in Accordance with NFPA 13, 13R 6.6.6:

38. _____ Type and locations of hangers, sleeves, braces, and methods of securing pipe are shown, 6.1.7.
39. _____ Pipe hanger spacing is in compliance with NFPA 13 Table 9.2.2.1.
40. _____ Branch lines show one hanger per section of pipe, exceptions are listed, NFPA 13 9.2.3.2.
41. _____ Mains show one hanger between each branch line unless the requirements in NFPA 13 9.2.4.2 through 9.2.4.5. are met, 9.2.4.
42. _____ Cross mains show one hanger between each two branch lines, exceptions are listed, NFPA 13 9.2.4.
43. _____ Risers in multistory buildings show supports at the lowest level, each alternate level, below offsets, and at the top, NFPA 13 9.2.5.3.
44. _____ Risers have a distance between supports not to exceed 25 ft., NFPA 13 9.2.5.4.

Drains and Test Connection:

45. _____ At least a 1 in. nominal diameter drain with a valve is detailed as being on the system side of the control valve, 6.6.2.1 and 6.6.2.2.
46. _____ Each portion of trapped dry system piping that is subject to freezing is provided a ½ in. drain, 6.6.2.4.
47. _____ The location and size of a test connection with a valve is detailed and complies with 6.6.3.1.

Pipe and Valves:

48. _____ One control valve is provided for both the domestic water and sprinkler, unless a separate control valve is provided for the sprinkler system, 6.6.1.1 and it is electronically supervised, IFC 903.4.

Seismic Bracing in Accordance with NFPA 13 Chapter 9, 13R 6.6.6:

49. _____ Flexible couplings may be used for pipe 2½ in. or larger in accordance with NFPA 13 Sections 9.3.2.2 and 9.3.2.3.
50. _____ A seismic separation assembly for piping is provided at building seismic joints, NFPA 13 9.3.3.
51. _____ Proper pipe clearance is noted on the plans for pipe penetrations in walls, floors, platforms or foundations, 9.3.4. Minimum clearance is in accordance with section NFPA 13 9.3.4.2 – 9.3.4.5.
52. _____ Lateral sway bracing is required at a maximum spacing of 40 ft. for all feed and cross mains, and branch lines 2½ in. and larger, NFPA 13 9.3.5.3.1.
53. _____ Lateral sway bracing can be spaced up to 50 ft. if the design is in compliance with NFPA 13 9.3.5.3.3.
54. _____ Lateral sway bracing is within 20 ft. of the end of the pipe, NFPA 13 9.3.5.3.2.
55. _____ A lateral sway brace is provided on the last pipe of a feed or cross main, NFPA 13 9.3.5.3.4.
56. _____ Lateral sway bracing is required unless all the pipes are supported by rods less than 6 in. or by 30° wrap-around U-hooks for any size pipe, NFPA 13 9.3.5.3.7 and 9.3.5.3.8.
57. _____ Longitudinal sway bracing is a maximum of 80 ft. for mains and cross mains and within 40 ft. of the end of the line, NFPA 13 9.3.5.4.
58. _____ A four-way sway brace spacing on a riser does not exceed 25 ft. and a four-way sway brace is located at the top of the riser if the top of the riser exceeds 3 ft. in length, NFPA 13 9.3.5.5.
59. _____ Seismic bracing calculations are detailed and provided for each brace to be used as shown in NFPA 13 Figure A.9.3.5.6(e).
60. _____ Longitudinal and lateral bracing is provided for each run of pipe between the change of direction unless the run is less than 12 ft. and supported by adjacent pipe run bracing, NFPA 13 9.3.5.11.
61. _____ Branch line method of restraint is detailed and in accordance with NFPA 13 Sections 9.3.6.1-9.3.6.3.

- 62. ___ Restraints for branch lines shall be at intervals not greater than 30 ft. if line movement will impact equipment or structural elements, NFPA 13 9.3.6.4, and restrain riser nipples 4 ft. long or greater against lateral movement, NFPA 13 9.3.6.5.
- 63. ___ Calculations for sway bracing zone of influence may be required, NFPA 13 9.3.5.6 – 9.3.5.11.

Fire Department Connection:

- 64. ___ For buildings whose area and height exceed the values specified in 6.6.4.1 a FDC is required.
- 65. ___ The FDC location is detailed on the street side or response side of building or as approved by the fire official, and when connected to the water supply it will not obstruct emergency vehicle access to the building, IFC 912.2.
- 66. ___ FDC is provided a connection that is at least a 1½ in., 6.6.4.2.

Design Criteria and Hydraulic Calculations:

- 67. ___ Hydraulic reference points match the plans.
- 68. ___ Pipe diameters match the plans.
- 69. ___ Sprinkler information matches the plans.
- 70. ___ Water flow information is provided; static PSI, residual PSI, GPM at 20 PSI residual with graphed results.
- 71. ___ The domestic water design demand is added to the sprinkler design when there is a single water supply, 6.5.5.
- 72. ___ Calculations are correct: static PSI, pipe length, GPM, calculated K-for for riser nipples or drop nipples, elevation data, hose allowance, friction loss, and equivalent pipe length, 6.7.1.4.
- 73. ___ Sprinklers without a listed discharge criteria are assigned a discharge criteria in accordance with, 6.7.1.1.1 and 6.7.1.1.2.
- 74. ___ Sprinklers with a listing discharge criteria: sprinklers comply with the discharge criteria for multiple and single sprinkler operation as required by their listing, 6.7.1.1.2.1, and at the discharge flow complies with 6.7.1.1.2.2.
- 75. ___ Sprinkler design for flat, smooth ceilings are calculated in accordance with Section 6.7.1.2 for the greatest hydraulic demand, 6.7.1.2.
- 76. ___ Sprinkler design for sloped, beamed, and pitched ceilings could require special design features such as larger flows or a design of 5 or more sprinklers to operate in the compartment, A.6.7.1.2.
- 77. ___ Sprinklers without a listed coverage criteria shall not exceed the area limits for sprinkler coverage area, 6.7.1.3.
- 78. ___ Hydraulic calculations are provided for single sprinkler and multisprinkler design.
- 79. ___ Areas outside dwelling unit shall have the design discharge, number of design sprinklers, coverage area, and sprinkler positions designed in accordance with Section 6.7.2.1.
- 80. ___ Areas outside dwelling unit: Residential sprinklers can protect building areas with flat smooth ceilings not exceeding 10 ft. as listed in Section 6.7.2.3.
- 81. ___ A garage separated from the residential building by fire-resistive construction that qualifies the garage as a separate building is sprinklered in accordance with NFPA 13 criteria, 6.7.3.1.
- 82. ___ Garage areas accessible by people from more than 1 dwelling unit and where the area is not constructed like 6.7.3.1 is a part of the building and is protected in accordance with 6.7.2, 6.7.3.2.
- 83. ___ A garage that is only accessible from 1 dwelling unit is a part of that dwelling and is sprinklered with residential sprinklers in accordance with NFPA 13R 6.7.1 or quick-response in accordance with, 6.7.3.3.
- 84. ___ A legend for calculation abbreviations is provided.
- 85. ___ A single combination water supply shall be allowed provided that the domestic demand is to the sprinkler demand as required by NFPA 13, IFC 903.3.5.1.2.

Additional Comments:

Review Date: _____	Approved or Disapproved	FD Reviewer: _____
Review Date: _____	Approved or Disapproved	FD Reviewer: _____
Review Date: _____	Approved or Disapproved	FD Reviewer: _____