

## 2.04 Fire Sprinkler Submittals (2019)

**Reference:** 2019 SFBC Sections 1.11.3 and 107.2.2 and \*\*2016 NFPA 13, 13R, & 13D. NFPA 13 Chapter 23; SFFD AB 2.09 & AB 4.11.

\*\*The 2016 editions of NFPA 13, 13R, & 13D are currently the adopted standards in the 2019 CFC and CBC.

**Purpose:** This bulletin describes the information to be provided on plans submitted for a building permit to install or modify a fire sprinkler system.

**NOTE:** Approved reference ARCHITECTURAL plans must be provided with NEW Fire Sprinkler System Plan submittals. (MECHANICAL plans may be required if applicable) Legible and readable working plans for each project floor (area of work) shall be drawn to an indicated scale (not smaller than 1/8 inch = 1 foot), on sheets of uniform size (11 x 17-inch minimum).

The scope of work must be indicated and the specific standard(s) used (e.g., NFPA 13, 13D, 13R) must be referenced. All NFPA 13D and 13R systems for R-3 occupancies shall have an approved reference architectural plan (signed by the DBI building inspector) indicating the specific type of the required sprinkler system (NFPA 13D or NFPA 13R) Plans shall detail those items from the following list which pertain to the design of the system. All details and information on drawing must be of sufficient size and clarity to be legible. Piping plans must NOT be submitted on a reflected ceiling plan.

**NOTE:** All pertinent information (if applicable) regarding the sprinkler system design shall be on the drawings: Current water flow information sheet provided by SFFD (within one year of the permit application date); sway bracing calculations; backflow preventer friction loss graph; fire pump curve; underground trench detail, etc. Hydraulic calculations sheets and materials submittals may be submitted separately.

### **THE FOLLOWING ITEMS MUST BE INCLUDED ON THE PLANS:**

1. Name and phone number of owner and occupant;
2. Address of building, including lot and block number;
3. Name, address, phone, and fax number of contractor;
4. Official Pre-Application meeting minutes, signed by all parties (if applicable)
5. Two sets of plans and one set of hydraulic calculations with the wet signature and stamp of the engineer or design-build C-16 contractor include the processed SFFD *Water-flow Request Form*. Provide one set of manufacturer's specification sheets for all components of the system;
6. Full height cross section, or schematic diagram, if required for clarity; including ceiling construction including height, type (beam, smooth), including open to the floor above, skylights. etc.; and method of protection for nonmetallic piping. Show beam size, material, and location on plan.
7. Provide a detailed and labeled riser/standpipe detail;

8. Provide site map of building location with directional indicator (this is required on all sheets);
9. Show all street locations and indicate main entrance to building for Fire Department access;
10. Indicate any windows that require exposure protection and for what reason and provide detail showing mullions, sprinkler orientation, dimensions etc. Approved architectural plans may be required for reference. If approved with an equivalency (DBI's AB-005), the minimum flow required for exposure sprinkler window protection shall be 3 GPM per lineal foot of window width.
11. Storage occupancies must show commodities being stored, maximum storage height, and distance from the ceiling or top of storage to sprinkler deflector: Please note: The drawings must include a completed Owner's Information Certificate, Fig. A.23.1 (b) 2016 NFPA 13.
12. If modifications are being done to a hydraulically designed sprinkler system, and the work being done is in a hydraulically remote area, provide hydraulic calculations;
13. Locations of fire walls and partitions, and occupancy class and use of each area or room;
14. Location and size of concealed spaces, indicating if they are combustible or non-combustible construction, closets, attics, and bathrooms;
15. Identify any small enclosures or spaces in which no sprinklers are to be installed and explain why and provide code sections;
16. Size of city main in street and whether it is dead-end or circulating; and, if dead-end, direction and distance to the nearest circulating main; Provide system elevation relative to test hydrant;
17. Other sources of water supply, with pressure or elevation;
18. Underground pipe size, length, location, weight, material (complete description, i.e. cement lined ductile iron), and point of connection to city main; the type of valves, meters, and valve pits; and the depth that the top of the pipe is laid below grade;
19. Piping provisions for flushing;
20. Approximate capacity in gallons of dry pipe system and total number of sprinklers controlled by any single interlocking pre-action system (each control valve not to exceed 1000 sprinklers);
21. Pipe type and schedule of wall thickness;
22. Nominal pipe size and cutting lengths of pipe using center to center dimensions; Note: Where typical branch lines prevail, it will be necessary to size only one typical line.
23. Location, size and length of riser nipple or drop;
24. Type of fittings (including description i.e. 125# cast iron threaded fittings, mechanical joints, above/below ground); joints & location of all welds and bends. The contractor shall specify on the drawing any sections to be shop welded (non-restraint type joint) and the type of fittings or formations to be used. For mechanical joints on underground piping provide thrust block size and details.
25. All control valves, check valves, drain pipes, and test connections including inspectors test assembly, also show relief valve for all systems per 2016 NFPA 13, Section 7.1.2 ;

26. Make, type, model, and size of alarm or dry pipe valve;
27. Make, type, model, and size of pre-action or deluge valve;
28. Kind and location of alarm bells;
29. Location of 3" hose outlets, hand hose, and related equipment;
30. The setting for pressure-reducing valves, include both static and residual pressures;
31. Information about backflow preventers (manufacturer, size, type);
32. SIN (Sprinkler Identification Number), manufacturer, manufacturer's model number, response type, temperature rating, sprinkler type, orifice size, and any other necessary identification information for all sprinklers used;
33. Temperature rating and location of high-temperature sprinklers;
34. Manufacturer's installation instructions and technical data for any specially listed equipment, including descriptions, applications and limitations for any sprinklers, devices, piping, or fittings. This includes backflow preventers, fire pumps (including pump curves), and pressure reducing valves, special design systems and accessory devices. Any underground or overhead flexible assemblies used shall meet or exceed the expected movement of the system.
35. Total area protected by each system on each floor;
36. Number of sprinklers on each riser per floor;
37. Total number of sprinklers on each dry pipe system, pre-action system, combined dry pipe pre-action system, or deluge system;
38. Hydraulic calculations or pipe schedule design criteria;
39. For hydraulically designed systems, the information on the hydraulic data nameplate for the most remote area for each hazard;
40. Provide graph of Supply/Demand Curve(s) showing available margin(s) for highest demand.
41. Hydraulic reference points shown on the plan shall correspond with comparable reference points on the hydraulic calculation sheets. Outline/highlight remote area;
42. Provide on the plan the minimum rate of water application (density), the design area of water application, in-rack sprinkler demand, and the water required for hose streams both inside and outside.
41. Provide on the plan the total quantity of water and the pressure required noted at a common reference point for each system;
42. Relative elevations of sprinklers, distance of sprinkler deflector to ceiling, junction points, and supply or reference points (see item 5);
43. If room design method is used, all unprotected wall openings throughout the protected floor;
44. Seismic sway bracing and hangers, sleeves, braces; methods of securing sprinklers: Provide type, manufacturer, size, and figure # for hanger components, including maximum size pipe hanger can support; fastener type, manufacturer, size, length minimum embedment depth, ceiling/beam/joist information (type, material, size) fastener is attached to;

45. Provide end-of-line restraint for end sprinkler on each branch line, except as allowed in section 9.3.6.5 of 2016 NFPA 13.

46. Calculation of loads for sway bracing, include details.

47. Any modification to an existing sprinkler system shall require seismic upgrades to all exposed and accessible portions within the area of work. These upgrades will be to the currently adopted NFPA 13 and CBC standards.

48. Where the equipment is to be installed as an addition to an existing system, enough of the existing system shall be indicated on the plans to make all conditions clear.

49. Any modification to an existing system shall include removal of unused excess piping. Relocation of heads shall be according to approved plan. Field installations which do not reflect the approved set of plans shall require recalculation of the system, taking into account all new piping and fittings.

50. All electrical rooms shall be provided with sprinkler protection. **Exception:** PG&E transformer rooms/vaults.

51. Buildings with elevators shall clearly show the elevator location and Elevator Machine Room (EMR) or Elevator Control Room (ECR). The elevator checklist from SFFD AB 2.01 Addendum "F" must be completed by the elevator contractor, and incorporated onto the sprinkler plans. Sprinklers requirements for elevators shall comply with all the specific requirements 1 through 9 and 52 through 55 listed below:

- 1) All Passenger Machine Room-Less (MRL) elevators, regardless their suspension means, shall be prohibited to have sprinkler protection in all their associated spaces: Elevator Control Room (ECR), hoistway's tops and hoistway's pits. All Passenger MRL elevators shall have smoke detector that generates Phase I Emergency Recall Operation, installed at the top of their hoistways in the machinery space containing the driving machine, as required by ASME A17.1. This smoke detector shall be accessible for repair, service, testing and maintenance from outside the hoistway (access hatch door or air-sampling type smoke detector – See AB # 2.01), as required by CCR-Title 8, Elevator Safety Orders.
- 2) All Passenger or Freight MRL elevators having coated-steel-belts as their suspension means, shall only be permitted to have FT-1 rated belts. Combustible belts (without FT-1 rating) shall be prohibited. All sprinkler plans showing MRL elevators with steel-coated-belts shall have a letter/document from the elevator manufacturer incorporated on the sprinkler plans certifying the specific provided belts as FT-1 rated belts.
- 3) Sprinklers shall be prohibited to be installed in all FSAE and OEE elevators hoistways (tops and pits), EMR and ECR.
- 4) Sprinklers shall be prohibited to be installed in all NEW hydraulic elevator pits – the effective date of this requirement applies for sprinkler plans submitted after the effective date of this AB. This requirement is not retroactive.
- 5) Sprinklers shall be required to be installed in all hydraulic elevator machine rooms with associated shunt trip function. The exception in CBC-2019 Section 3005.4.1 shall not apply. The CBC-2019 amendment for this requirement in Chapter 35 shall not apply. Sprinklers installed in hydraulic elevators' machine rooms shall not be Quick Response type sprinklers. They must have a higher Response Time Index (RTI) than their associated heat detector which is required to be installed within 24 inches of each EMR sprinkler.

- 6) All freight elevators: Hydraulic type or Traction (including MRL) type, shall have sprinkler protection at their associated top of hoistway, as required by NFPA 13-2016. These sprinklers shall have associated smoke and heat detection installed at the top of the hoistway and accessible from outside the hoistway, and an associated shunt trip function.
- 7) Traction standard overhead passenger elevators, having an associated EMR, shall be prohibited to have sprinklers in their associated EMR and also be prohibited from having a smoke detector in their associated hoistway, unless if it used to generate hoistway venting. Any smoke detector installed in an elevator hoistway, shall be required to generate Phase I Emergency Recall Operation.
- 8) Standard overhead traction freight elevators shall not have sprinklers in their associated EMR.
- 9) MRL freight elevators shall not have sprinklers in their associated ECR.

52. Sprinkler requirements for Private Residence Elevators in R-3 and R-2 occupancies: In R-3 Occupancies, there are no standard "Passenger elevators". R-3 and some R-2 Occupancies are provided with **Private Residence – Limited Use Limited Application (LULA) Elevators per ASME A17.1 Section 5.3**. Sprinklers shall only be required in hydraulic LULA elevators machine rooms. Sprinklers shall be prohibited to be installed in hydraulic LULA hoistways (tops and pits). Since these LULA elevators are not capable of Phase I Emergency Recall Operation function, they shall not be provided with a shunt trip function.

53. Sprinklers shall not be provided in the hoistway (top and pit) and in the EMR of private residence elevator installed in an R-3 occupancy protected by an NFPA 13D system.

54. If the elevator is LULA per Section 5.2 of the A17.1 code, sprinkler shall only be provided in hydraulic LULA machine rooms. If the LULA elevator (per Section 5.2 of the A17.1 code) is not capable of Phase I Emergency Recall Operation, then the shunt trip function shall not be provided

55. All traction type LULA elevators shall not have sprinklers in their associated spaces (EMRs and Hoistways tops and pits)