

## 2.04 Fire Sprinkler Submittals (2022)

**Reference:** 2022 CBC, 2022 CFC and 2022 NFPA 13, 13R, & 13D.

**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). All fonts throughout the plans shall not be smaller than 1/8" in size.

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. A separate reflected ceiling plan showing fire sprinkler locations only, but no piping shall be provided, and shall identify all ceiling features, elevations, structural members, ducts, lighting, and any other potential obstructions. The reflected ceiling plan shall identify whether the ceiling is obstructed or unobstructed construction as defined in NFPA 13 for each room/area.

All working drawings, regardless of the type of fire suppression system, must meet the drawing requirements in NFPA 13 for Working Drawings, unless the system specific standard has requirements for working drawings.

**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 12 months of the permit application date per 2022 NFPA 13 Section 4.5.1.1); 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; Provide one set of manufacturer's specification sheets for all components of the system; include the processed SFFD *Water-flow Request Form*. The Fire Department will provide water flow and supply information when requested by the applicant. The Department shall assess fees for this service as stated in Section 106.12 of the 2022 SFFC. The water flow test information

provided by SFFD is valid for a maximum of 12 months from the date of the test to the date of the associated permit application.

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. Any required architectural features and/or dimensions required for compliance with the installation requirements of specially listed window sprinklers shall be documented in the approved architectural plans, and provided for reference with the sprinkler plans.
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.28.1 (b) 2022 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; Other sources of water supply, with pressure or elevation;
17. 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;
18. Piping provisions for flushing;
19. 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); Calculation program and method shall be listed by nationally recognized testing laboratory.
20. Pipe type and schedule of wall thickness;
21. 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.

22. Location, size and length of riser nipple or drop;
23. 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.
24. All control valves, check valves, drain pipes, and test connections including inspectors test assembly, also show relief valve for all systems per 2022 NFPA 13, Section 8.1.2 ;
25. Make, type, model, and size of alarm or dry pipe valve;
26. Make, type, model, and size of pre-action or deluge valve;
27. Kind and location of alarm bells;
28. Location of 3" hose outlets, hand hose, and related equipment;
29. The setting for pressure-reducing valves, include both static and residual pressures;
30. Information about backflow preventers (manufacturer, size, type); Type must comply with San Francisco Public Utilities Commission's Rules and Regulation (Resolution No. 19.786). Certain projects located on Port of San Francisco property within a certain distance of the waterfront may require a reduced-pressure principal type backflow preventer assembly. Note that this type of backflow preventer assembly may require additional drain capacity. Refer to SFPUC Resolution No. 19.786 for additional information. Contact the SFPUC for further guidance.
31. 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;
32. Temperature rating and location of high-temperature sprinklers;
33. 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.
34. Total area protected by each system on each floor;
35. Number of sprinklers on each riser per floor;
36. Total number of sprinklers on each dry pipe system, pre-action system, combined dry pipe pre-action system, or deluge system;
37. Sprinkler systems must be designed using hydraulic calculations unless additions or modifications to existing pipe schedule systems. When 20 or less sprinklers are modified or relocated, hydraulic calculations are not required except if installing new flexible pipe, or if the water supply pipe routing or back flow preventer assembly are modified/replaced. Hydraulic calculations should be based on a waterflow test that was performed no more than 12 months prior to submission of the calculations.
38. For hydraulically designed systems, the information on the hydraulic data nameplate for the most remote area for each hazard;
39. Provide graph of Supply/Demand Curve(s) showing available margin(s) for highest

demand.

40. Hydraulic reference points shown on the plan shall correspond with comparable reference points on the hydraulic calculation sheets. Outline/highlight remote area;

41. 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.

42. Provide on the plan the total quantity of water and the pressure required noted at a common reference point for each system;

43. Relative elevations of sprinklers, distance of sprinkler deflector to ceiling, junction points, and supply or reference points (see item 5);

44. If room design method is used, all unprotected wall openings throughout the protected floor;

45. 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.

46. Provide end-of-line restraint for end sprinkler on each branch line, except as allowed in section 18.4.13.1 of 2022 NFPA 13.

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

48. 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. Sway bracing calculations per 2022 NFPA 13 must be provided. If, per the calculations, the existing sway bracing in the work area only do not meet the 2022 NFPA 13 spacing requirements, additional sway bracing shall be provided as required.

49. 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.

50. 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.

51. All electrical rooms shall be provided with sprinkler protection, regardless of their fire resistance rating. Exception: PG&E transformer rooms/vaults.

52. The parking garage(s) areas in R-3 and R-2 occupancies that are provided with NFPA 13R systems, shall be hydraulically calculated per NFPA 13 – Ordinary Hazard Group 2 (OH2) per 2022 NFPA 13 Section 4.3.3.2 and A.4.3.3.2. Only private garages in R-3 occupancies having 13D systems shall not be required to be calculated per NFPA 13 OH2. Private garages that contain EV(s) and associated charging station(s) and/or power walls, shall be hydraulically calculated per NFPA 13 OH2.

53. For specific sprinkler system requirements for parking spaces associated with EV charging stations in any occupancy other than Group R-3, please refer to 2022 AB 4.29.

54. For specific sprinkler system requirements associated with car stacker /lift systems, please refer to 2022 AB # 4.25.

55. CPVC underground piping are prohibited by SFPUC. Whether combination or dedicated fire underground, it must be braised copper K (may be used up to 2" in diameter) or ductile iron for piping greater than 2" in diameter.

56. All new water-based fire suppression systems must have test valves installed downstream of the backflow preventer

57. Nonmetallic (such as CPVC, etc.) sprinkler piping is only permitted to be installed in residential occupancies per their specific listing. This piping shall be installed concealed in the wall or ceiling assemblies behind a minimum of one-layer of 5/8 thick gypsum board and they shall not be permitted to be exposed in any location within the building. The specific installation of exposed nonmetallic system risers in garages of R-2 and R-3 occupancies is prohibited. Installation of nonmetallic system risers shall only be permitted when they are concealed in a wall or installed within a dedicated enclosure/closet behind a minimum of one-layer of 5/8 thick gypsum board with an associated access door required to access all riser components for testing, repair and maintenance

58. Where an occupancy classification is not listed in 2022 NFPA 13 occupancies example in Section 4.3, the applicable NFPA Standard must be used along with engineering judgement to determine the appropriate occupancy hazard classification. The following will be classified as Ordinary Hazard Group 1 (OH1) in addition to the 2022 NFPA 13 examples listed in Section A.4.3.3.1

- Fitness Center

- Gymnasium

- Electrical Rooms other than transformer vaults.

59. Sprinkler Protections requirements for Phone/Privacy Booths/ Pods

All proposed Phone/Privacy Booths/Pods must be permanent structures attached to the building and have an associated building permit reviewed by DBI building inspector. Any phone/privacy booth/pod exceeding a 4-foot dimension in any direction shall be provided with a sprinkler protection within the booth/pod connected to the building sprinkler system. Phone/Privacy booths/pods with dimensions of less than 4-feet in any direction shall be exempt from sprinkler protection inside the booth as long as they have minimum 4-foot clearance from any other adjacent booth/pod or any other similar obstruction, and as long as they are constructed of non-combustible materials (manufacturer's cut sheets of the specific booth/pod must be provided for DBI and SFFD review and be placed/scanned onto the building permit plans).

60. Buildings with elevators shall clearly show the elevator location and Elevator Machine Room (EMR) or Elevator Control Room (ECR) on the associated permit plans. The elevator checklist from SFFD 2022 AB 2.01 Addendum "F" must be completed by the elevator contractor/service company, and incorporated onto the sprinkler plans. Sprinklers requirements for elevators shall comply with all the specific applicable requirements of 1 through 9 of this AB # 2.04 and 61 through 63 listed below:

61. 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), hoistways tops and hoistways 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 2022 AB # 2.01), as required by CCR-Title 8, Elevator Safety Orders and 2022 NFPA 72 Section 21.3.7.

62. All Passenger or Freight MRL elevators having coated-steel-belts as their suspension means, shall only be permitted to have FT-1 non-combustible or limited/combustible 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 non/limited-combustible rated belts.

63. Sprinklers shall be prohibited to be installed in all FSAE and OEE elevators hoistways (tops and pits), EMR and ECR.

64. NEW sprinkler(s) shall be prohibited to be installed in all NEW hydraulic elevator pits and in existing hydraulic elevator pits having non-combustible hoistways and non-combustible cars. This requirement is not retroactive for existing hydraulic elevators provided with pit sprinkler(s).

65. Sprinklers shall be required to be installed in all new hydraulic elevator machine rooms with an additional associated shunt trip function and for existing hydraulic elevators going through alteration/modernization process. This requirement only applies to sprinklered buildings having full or partial sprinkler system (Non-sprinklered building shall not be required to have sprinkler protection in hydraulic elevators machine rooms and shunt trip function shall not be required). Sprinklers installed in hydraulic elevators' machine rooms shall not be Quick Response (QR) type sprinklers per 2022 NFPA 13. 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.

66. All freight elevators: Hydraulic type or Traction (including MRL) type, shall have sprinkler protection at their associated top of hoistway, as required by 2022 NFPA 13. These sprinklers shall have associated smoke and heat detection installed at the top of the hoistway and accessible from outside the hoistway per 2022 NFPA 72 Section 21.3.7 and A.21.3.7, and they shall have an associated shunt trip function. Per CA Elevator Unit, the shunt trip breaker shall be installed in the EMR and be a listed combination device together with the elevator main line-disconnect switch.

67. Standard traction/electric 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 per 2022 NFPA 72. Any smoke detector installed in an elevator hoistway, shall be required to generate Phase I Emergency Recall Operation.

68. Standard overhead traction/electric freight elevators shall not have sprinklers in their associated EMR.

69. MRL freight elevators shall not have sprinklers in their associated ECR.

70. 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 typically provided with Private Residence Elevators per ASME A17.1-2004 Section 5.3. Sprinklers shall only be required in hydraulic Private Residence elevators machine rooms. Sprinklers shall be prohibited to be installed in hydraulic Private Residence hoistways (tops and pits). Since these elevators are not capable of Phase I

Emergency Recall Operation function, they shall not be provided with a shunt trip function.

71. 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.

72. If the elevator is Limited-Use-Limited-Access (LULA) per Section 5.2 of the ASME A17.1-2004 code, sprinkler shall only be provided in the 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

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

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