2.04 Fire Sprinkler Submittals (2016)

Reference: 2016 SFBC Sections 1.11.3 and 107.2.2 and 2016 NFPA 13, Chapter 23, SFFD AB 2.09

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. 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 and scanned. Piping plans must NOT be submitted on a reflected ceiling plan.

NOTE: Only the drawings are scanned and all pertinent information regarding the sprinkler system shall be on the drawings. Any references to submittal specification sheets or hydraulic calculations are not acceptable.

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.

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 current NFPA 13 and the current 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 (see Addendum "A") shall clearly show the elevator location and include the following information on the plans (check ☑ applicable boxes below):
    - Passenger elevator: yes☐ **or** no☐ (If no, assumed to be freight elevator)
    - Elevator hoist way is noncombustible or limited combustible: yes☐ **or** no☐
    - Elevator car enclosure material meet the requirements of ASME A17.1, Safety Code for Elevators and Escalators: yes☐ **or** no☐
    - Elevators utilize polyurethane-coated steel belts or other similar combustible material: yes☐ **or** no☐
    - Elevator is a: traction/cable elevator☐ **or** hydraulic elevator☐ **or** Machine room-less elevator☐

ADDENDUM "A"
SPRINKLER PROTECTION GUIDE FOR ELEVATORS

PER THE 2016 CBC AND NFPA 13-2016 SECTIONS 8.1.1 & 8.15.5

BASED ON CA TITLE 8 ELEVATOR SAFETY ORDERS (ESO)
DIVISION 1, CHAPTER 4, SUBCHAPTER 6 -FOR GROUP 4 ELEVATORS:
GROUP 4. CONVEYANCE INSTALLATIONS FOR WHICH THE INSTALLATION CONTRACT WAS SIGNED ON OR AFTER MAY 1, 2008 (Sections 3140-3146)

1) All Machine Room-Less (MRL) group 4 elevators regardless their suspension means (combustible or limited combustible coated steel belts or noncombustible steel ropes)shall have a smoke detector, in lieu of a sprinkler, installed at the top of their hoistway -accessible for repair, service, testing and maintenance from outside the hoistway(access hatch door or air-sampling type smoke detector).

a) This requirement applies to all *MRL passenger elevators* in all new high-rise and low-rise buildings.
b) See item 3) for *MRL freight elevators*.
c) This requirement is based upon NFPA 13-16 Sec. 8.15.5.3 for traction (non-hydraulic) elevators only, whereby a smoke detector can be provided in lieu of a sprinkler in these spaces.
d) All *MRL elevators* have a drive motor located at the *hoistway* which maybe the source of ignition, not the suspension means. NFPA 13-16 Sec. 8.15.5.7.2 does not require sprinklers when limited combustible coated steel belts rated as FT-1 per UL 62 and UL 1581 are present in elevator hoistways including the pit, see item g).
e) The elevator controller can be located anywhere in the building. When located in a *control room* or *control space* (similar to the machinery space at the top of a *hoistway*) a smoke detector, in lieu of a sprinkler, shall be installed in those spaces. In the state of CA, elevator controllers are not permitted to reside inside the elevator hoistway, per Title 8 ESO.
f) No sprinkler pipe or other water-filled piping is allowed in *MRL elevator hoistways*, machinery spaces, *control rooms* or *control spaces*.
g) A sprinkler is not required in the *elevator pit* for traction/electric elevators regardless of the suspension means. Only the presence of combustible hydraulic fluid requires a sprinkler in the *pit* per item 6).

2) All passenger elevators and passenger elevators serving as service elevators (traction or hydraulic) shall not have sprinklers installed at the top of their hoistway.

a) This requirement applies to all *passenger elevators* in all new high-rise and low-rise buildings.
b) See item 1) for *MRL passenger elevators*.
c) See item 3) for *freight elevators* and *MRL freight elevators*.
d) This requirement is based upon the 2016 CBC Sec. 903.3.1.1.1-3,-4 whereby a smoke detector can be provided in lieu of a sprinkler in this space.
e) Sprinklers shall not be installed in this space per NFPA 13-16 Sec. 8.15.5.3 and 8.15.5.6 for all *passenger elevators*.
f) NFPA 13-16 Sec. 8.15.5.7.2 does not require sprinklers in this space when limited combustible coated steel belts are present.
g) Sprinklers shall not be installed in this space per the 2016 CBC Section 3007.2.1 for *Fire Service Access Elevators* and Section 3008.2.1for *Occupant Evacuation Elevators*.
h) No sprinkler pipe or other water-filled piping is allowed in this space.

3) All Freight elevators shall have sprinklers installed at the top of their hoistways per NFPA 13 -this will trigger smoke and heat detectors at the top of the hoistway accessible from outside the hoistway and associated shunt trip function (to be generated upon the heat detector/s located at the top of the hoistway within 2 feet of each sprinkler)

a) This requirement applies to all *freight elevators* and *MRL freight elevators* in all new high-rise and low-rise buildings.

b) Sprinklers are required in this space per NFPA 13-16 Sec. 8.15.5.3 through 8.15.5.6 since ***freight elevator cars*** do not meet the fire-rating requirements of ASME A17.1.
c) A separate flow switch and control valve are not required to be installed in the supply piping to sprinklers in this space.

4) All hydraulic elevator machine rooms shall be protected by sprinklers per NFPA 13-16 Sec. 8.15.5.3(5), and be provided with associated smoke and heat detectors and shunt trip function.

a) This requirement applies to all *hydraulic elevators* in all new high-rise and low-rise buildings (usually 1-7 stories in height).
b) A separate flow switch and control valve are not required to be installed in the supply piping to sprinklers in this space.
c) The 2016 CBC Section 3005.4.1 (exempt sprinkler locations) shall not apply to hydraulic elevators.

4) All hydraulic elevator machine rooms shall be protected by sprinklers per NFPA 13-16 Sec. 8.15.5.3(5), and be provided with associated smoke and heat detectors and shunt trip function.

a) This requirement applies to all ***hydraulic elevators*** in all new high-rise and low-rise buildings (usually 1-7 stories in height).
b) A separate flow switch and control valve are not required to be installed in the supply piping to sprinklers in this space.

5) All traction elevators shall not have sprinklers installed in their machine rooms, machinery spaces, or control rooms or control spaces -only a smoke detector shall be installed in those places to activate elevator phase 1 emergency recall operation.

a) This requirement applies to all ***traction elevators*** in all new high-rise and low-rise buildings.
b) See items 4) and 6) for ***hydraulic elevators***.
c) This requirement is based upon the 2016 CBC Sec.903.3.1.1.1-3,-4 and 3005.4.1 whereby a smoke detector can be provided in lieu of a sprinkler in this space.
d) Sprinklers shall not be installed in these spaces per NFPA 13-16 Sec. 8.15.5.3.
e) Sprinklers shall not be installed in these spaces per the 201 6 CBC Sections 903.3.1.1.1-3 and 3007.2.1 for ***Fire Service Access Elevators***.
f) Sprinklers shall not be installed in these spaces per the 2016 CBC Sections 903.3.1.1.1-4 and 3008.2.1 for ***Occupant Evacuation Elevators***.
g) No sprinkler pipe or other water-filled piping is allowed in these spaces.

6) All hydraulic elevators shall have sprinklers installed at their elevator pit within 24 inches of the pit floor per NFPA 13-16 Sec. 8.15.5.1.

a) This requirement applies to all ***hydraulic elevators*** in all new high-rise and low-rise buildings (usually 1-7 stories in height).
b) Hydraulic fluid may be the source of fire in this space requiring sprinkler protection per NFPA 13-16 Sec. 8.15.5.1 and 8.15.5.2.
c) See item 1) for ***MRL elevator*** *pits*.

7) Sprinkler requirements for Private Residence Elevators (hydraulic) in R-3 occupancies:

In R-3 Occupancies, there are no standard “Passenger elevators”–R-3 Occupancies are provided with “**Private Residence” LULA Elevators per ASME A17.1-2004 Section 5.3**

Private Residence –LULAs per A17.1-2004 Section 5.3 are Not Capable of Recall and therefore shall not be provided with a shunt trip function.

If the R-3 Occupancy is provided with:

a. NFPA 13 System - sprinklers must be provided in the elevator pit and in the elevator machine room

b. NFPA 13R System – Sprinkler shall not be provided in the hoistway (top and pit) per Section 6.6.6 – but the hoistway must be of non-combustible construction (No wood, etc.). Sprinklers must be provided in the elevator machine room.

c. NFPA 13D System —Sprinkler shall not be provided in the hoistway (top and pit) per Section 8.3.5. Sprinklers are not required in the elevator machine room.

8) Sprinkler requirements for LULA elevators or Passenger elevators in R-2 Occupancies provided with NFPA 13 or NFPA 13R systems:

If the R-2 Occupancy is provided with:

a. NFPA 13 System - Sprinklers shall be provided in the pit and in the elevator machine room – If the elevator is passenger – Recall function shall be provided and Shunt trip function shall be provided upon the EMR sprinkler. If the elevator is LULA (per Section 5.2 or 5.3 in the A17.1-2004 Code or Article 15 in title 8 ESO) and the LULA elevator is not capable of Recall, than the shunt trip function shall not be provided.

b. NFPA 13R System – Sprinklers shall not be provided in the pit if the hoistway is non-combustible, but they shall be provided in the EMR since the building (up to 4 stories) may contain a large number of sleeping units..(The risk is much higher than for an R-3 Occupancy). If the elevator is passenger – Recall function shall be provided and Shunt trip function shall be provided upon the EMR sprinkler. If the elevator is LULA (per Section 5.2 or 5.3 in the A17.1-2004 Code or Article 15 in title 8) – and the LULA elevator is not capable of Recall, than the shunt trip function shall not be provided.