Fire Sprinkler Plan Submittal Requirements

Please submit the following information:

- Minimum 3 sets of plans, shop drawings, calculations and submittal data
- Any requests for VUSBC modifications
- A signed copy of completed owner's affidavit NFPA 22.1.4
- Current water flow test results and location
- 2 sets of job specifications

Plans shall include the following information at a minimum:

☐ Must be to scale
☐ Sealed by an architect or engineer (not required for less than 20 heads)

Include building code data:
- ☐ Height and area
- ☐ NFPA standard 13 or 13R
- ☐ Required or elective

☐ Schematic of underground piping, building entry, size and length of pipe to main and show all valves, meters and backflow device

☐ The submitted plans shall clearly show a floor plan of each story, indicating the location of all walls, partitions, and fire rated assemblies. The intended use of each area, room, or void space shall be indicated on the plans. NFPA 13 - Section 22.1.3

☐ The submitted plans shall clearly indicate total area, protected by each system riser on each floor. NFPA 13 – Section 22.1.3

☐ Full height cross-section elevation detail(s) indicating construction, and the vertical and horizontal distances of sprinklers relative to the underside of roof or ceiling and structural members to verify if the construction is obstructed or unobstructed. NFPA 13 – Section 22.1.3

☐ The submitted plans shall clearly indicate the type and the location of all control valves, drain valves, test connections, hose outlets, and related equipment and piping. NFPA 13– Section 22.1.3

☐ Indicate the location and the type of audible and/or visual alarm devices located inside and outside of the building. NFPA 13 – Section 22.1.3 and IBC, Section 903.4.2

☐ Clearly indicate the manufacturer, the temperature rating, the orifice size, the hydraulic K-factor, whether the sprinklers are standard or quick response, and quantity of each type of sprinkler to be installed. NFPA 13 - Section 22.1.3

☐ Clearly indicate the location of all special sprinklers, such as extended coverage, sidewall, intermediate or high temperature sprinklers. NFPA 13 –Section 22.1.3

☐ Clearly indicate the pipe types and the wall thickness, the type of fittings and joints, and the type and locations of hangers, sleeves, braces, and method to support sprinkler components. NFPA 13 - Section 22.1.3

☐ Clearly indicate the nominal pipe size and the cutting lengths of pipe, center-to-center dimensions, including riser nipples, drop nipples, and armovers. NFPA 13 – Section 22.1.3

☐ Clearly indicate the method of protection for non-metallic piping as required by pipe manufacturer (nail plates and/or thermal insulation). NFPA 13 - Section 22.1.3

☐ The submitted plans shall clearly indicate the method of maintaining a minimum temperature of 40° F for sprinkler system piping installed in unconditioned spaces. (Special note: tenting method requires properly secured, minimum R-30 unfaced batt insulation. See NFPA 13R – Annex A – Figures A 5.3.2 (a, b, c, d, and e for proper insulation method) NFPA 13 – Section 5-14.3.

☐ Hydraulically designed systems:
1. Required hydraulic data nameplate information. NFPA 13 – Section 22.13
a. The minimum rate of water application (density)
b. The location and size of the design area
c. The inside and outside hose stream allowances as actually provided based on the actual hazard being protected in accordance with NFPA 13 – Chapters 12-20.
d. The required flow and residual pressure at base of riser
e. The occupancy classification
2. The hydraulic reference points shall be indicated on the plan corresponding with hydraulic calculation sheets. NFPA 13 – Section 22.1.3
3. The protection areas covered per sprinkler head. NFPA 13 - Table 8.6.2.2.1 (a, b, c and d)
4. Provide a copy of Water flow test results, dated within six months of plan submission date. NFPA 13 – Section 22.1.3

☐ Graph sheet. A graphic representation of the hydraulic demand shall be plotted on graph paper ($Q^{1.85}$) or computer generated hydraulic program based upon NFPA 13 – Section 22.3.
1. Water flow data
2. Total sprinkler system hydraulic demand including hose streams

Tenant upfit requirements

☐ Where existing systems are to be modified, sufficient details of the existing system shall be shown on the plans to determine the effect of proposed modification on total system. NFPA 13 – Section 22.1.3

☐ The submitted plans shall include a shopping center key plan or complete building floor plan indicating the location of the affected tenant space(s).

☐ The submitted plans shall clearly indicate the location and the floor level of the hydraulic remote area and its design criteria.

☐ Work being performed in the hydraulic remote area shall include hydraulic calculation and water flow test results dated within six months of plan submission date.

Limited area sprinkler

☐ The submitted plans shall provide a key plan showing the room or space to be protected. The plans shall indicate the location in the building, room number (s) or floor where the work is to be performed.

☐ Hydraulic calculations shall be provided in accordance with NFPA 13 - Sections 22.2, 22.3 and the International Building Code (2009 Edition) Section 903.3.5.1.1 Where the sprinkler system is supplied through a domestic water meter, calculations shall be provided.

☐ When a control valve is provided downstream from the domestic water control valve the limited area sprinkler system shall be supervised in accordance with International Building Code (2009 edition)Section 903.3.5.1.1 - Exception and Section 903.4.

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Storage Occupancy

Miscellaneous Storage ≤ twelve feet in height

☐ The submitted plans shall clearly identify and indicate the commodity classification, the maximum storage height, the proposed storage arrangement, the widths and locations of all aisles. NFPA 13 Chapter 13, Figure 13.2.1; Table 13.2.1

☐ The submitted plans shall clearly indicate the roof or ceiling height within the storage area.

Storage Commodities

☐ The submitted plans shall clearly indicate which of the following sprinkler system design is to be used in accordance with NFPA 13 – Chapters 15, 16, 17, 18, 19, 20, 21, NFPA 30, NFPA 30B, and NFPA 33
1. Control Mode Sprinklers
2. Large Drop and Specific Application Control Mode Sprinklers
3. Suppression Mode Sprinklers (ESFR)

☐ The submitted plans shall clearly indicate the commodity classification, the maximum storage height, the proposed storage arrangement, the widths and locations of all aisles. NFPA 13 – Section 22.1.3

☐ The submitted plans shall clearly indicate the minimum and the maximum distance between the sprinkler deflector and the top of the storage.

☐ The submitted plans shall clearly indicate the rack configuration, the width and height of the racks and the location and size of the rack flue spaces for the following arrangements:
1. Single Row Racks
2. Double Row Racks
3. Multiple Rows Racks
4. Shelf Storage Units, as defined by NFPA 13 – Section 3.9.2.6

The submitted plans shall clearly indicate the method of storage to be used:
1. Wood pallets on racks
2. Expanded plastic pallets on racks
3. Solid shelving
4. Open shelving
5. Encapsulated wrapping materials

☐ The submitted plans shall clearly indicate the location of all interior small hose stations or an approved alternative design. NFPA 13 – Section 12.8.4

Manufacturer's Data Sheet

All submissions shall include the appropriate Manufacturer's Data Sheets for the following:
☐ Where manufacturer's data sheets cover multiple devices, the submitted data sheet shall indicate those devices used in the system.
☐ Pipe – Indicate if pipe is factory or field anti-microbial coated, if applicable
☐ Fittings (Threaded, Grooved, Welded)
☐ Valves (O.S. & Y., Butterfly, PIVs)
☐ Hangers/Rod/Fasteners/Clamps
☐ Alarm Check Valve/Retard Chamber/Water Motor Alarm
☐ Swing Check Valves
☐ Fire Department Connections
☐ Sprinkler Heads/Spray Nozzles
☐ Inspectors Test Connections/Drain Assemblies
☐ Riser Manifolds
☐ Backflow Prevention Devices/RPZ's/Detector Check Valves – Including friction loss tables
(Please note: a separate backflow permit must be obtained prior to installation of the device. Failure to obtain permit prior to installation could result in wrong device being installed and will require replacement).
☐ Pressure Regulating Valves – Indicating the factory pressure setting
☐ Dry Pipe Valves/Accelerators/Exhausters/Actuation Devices and System/Trim
☐ Deluge Valves/Preaction Valves/Actuation Devices and Systems/Trim
☐ Valve Supervisory Switches
☐ Waterflow Vane Switches
☐ Pressure Switches
☐ Fire Pumps/Accessories
☐ Fire Pump Drivers/Accessories
☐ Fire Pump Controllers
☐ Jockey Pumps
☐ Jockey Pump Controllers
☐ Relief Valves
☐ Fire Hose Valves
☐ Special System Components (Foam, Antifreeze, Water Mist, Etc.)
☐ Other_____
☐ Other _____

Where multiple contractors are involved in the system design and installation, the plan approval requires the concurrent submittal and review of the fire suppression and detection systems.

Special Notes

☐ The submitted plans shall clearly indicate the location of the device to be used for flow tests at system demand, downstream of all backflow prevention valves. NFPA 13 –Section 8.17.4.6.1
☐ All sprinkler systems are required to be monitored off-site to an approved supervising station, with the exception of NFPA 13D – One and Two-Family Dwellings and Manufactured Housing and Limited Area Sprinkler Systems as permitted by the International Building Code (2009 Edition). International Building Code (2009 Edition) Section 901.6.1 Exceptions 1 and 2
☐ All piping between the sprinkler system and a pressure actuated water flow alarm initiating device or High/Low Air Pressure Switch supervisory device shall be galvanized, nonferrous metal, or other approved corrosion resistant material. NFPA-72 (2007 Edition) Section A5.11.1
☐ The submitted plans shall clearly indicate the make, type, model, and size of all dry pipe valves, pre-action valves, or deluge valves. NFPA 13 – Section 22.1.3
☐ The submitted plans shall clearly indicate the water capacity, in gallons, of each dry pipe and pre-action system. NFPA 13 – Section 22.1.3
☐ The submitted plans shall clearly indicate the air pressure settings for dry pipe valves and the supervisory air functions at normal and abnormal conditions.
☐ Antifreeze systems shall be prepared with minimum freezing point of -26° F, and a recommended maximum 40-gallon capacity. NFPA 13 – Section 7.6
☐ In addition to standard hydraulic calculations, antifreeze systems with a solution capacity greater than 40 gallons shall also be calculated using the Darcy-Weisbach formula. A copy of the annotated Moody diagram shall be included. NFPA 13 – Section 22.4.2.1.3
☐ An approved reduced pressure principle backflow prevention device, RPZ-listed assembly, including approved indicating control valves shall be provided at the point of connection of the wet pipe sprinkler system supplying the anti-freeze sprinkler system.
☐ An approved, listed reduced pressure backflow prevention device is required on all antifreeze systems. NFPA 13 – Section 7.6.3.2; Figure 7.6.3.2
☐ An approved, listed expansion chamber shall be provided on all antifreeze systems. NFPA 13 – Section 7.6.3.3
☐ All fire pump and booster fire pump installations shall comply with NFPA 20.

<u>Hydraulic Calculation Forms</u>

If using non-computer generated hydraulic calculations:

☐ Hydraulic calculations shall be prepared on form sheets that include a summary sheet, detailed worksheets and a graph sheet. NFPA 13 - Figures A22.3.2 (a), A22.3.3 and A22.3.4
☐ The calculation summary sheet shall indicate the hazard classification for the system design. When multiple designs are required to protect various hazards with a common system area, separate calculations shall be provided for each hazard area. NFPA 13 -Section 22.3
☐ The required calculation summary sheet shall include:
1. The design density and the total design area, such as a 0.1 gpm per square foot over the hydraulically most demanding 1500 square feet. NFPA 13 - Section 22.3
2. The maximum area of coverage per sprinkler. NFPA 13 – Section 22.3

3. The total system demand at the base of the riser. Water for inside and outside hose streams shall be represented as it is actually provided. NFPA 13 – Section 22.3

☐ Graph sheet. A graphic representation of the hydraulic demand shall be plotted on graph paper (Qn1.85) or computer generated hydraulic program based upon:
1. Water flow data
2. The total sprinkler system hydraulic demand including the in-rack demand and the inside and outside hose streams requirements. NFPA 13 – Section 22.3.4
☐ The hydraulic calculations provided shall include the domestic water demand if sprinkler system is supplied through a common domestic meter. NFPA 13 - Section 22.3 and the International Building Code - Section 903.3.5.1.

If using computer generated hydraulic reports:

☐ The hydraulic calculations shall be prepared on form sheets that include a summary sheet, a graph sheet, a water supply analysis, a node analysis and detailed worksheets. NFPA 13 – Sections 22.3.5.2, 22.3.5.3, 22.3.5.4, 22.3.5.5 and 22.3.5.6
☐ The data developed from computer generated hydraulic calculations shall be presented in the order shown in NFPA 13 - Figures 22.3.5.1 (a, b, c, and d).

Please call (540) 994-8606 if you have any questions.