



# Orange Township Fire Department Fire Prevention Bureau

## Above Ground Fire Sprinkler System Submittal Check List

<b>Project Name:</b>	<b>Date:</b>
<b>Project Address:</b>	
<b>Designers Name:</b>	
<b>Company Name:</b>	
<b>Phone Number:</b>	
<b>Email:</b>	<b>Fax:</b>

All supporting documentation showing items listed below are required for review. The checklist is based on the **2010 Edition of NFPA 13** and the **2011 Ohio Fire Code Chapter 9.**

### **BOXES MUST BE CHECKED (X) UPON COMPLETION**

#### **General (All submissions shall include the following):**

- Paper Media:** One (1) full set of shop drawings 30" X 42" of standard engineered scale ( 1:10, 1:20, 1:30, 1:40, 1:50, 1:60), shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed and show in detail that it will conform to the provisions of this code relevant laws, and specific provisions.

**Electronic Media:** One (1) AutoCAD Base w/ TIFF image of each sheet, PDF or Jpeg on a Compact Disc in a hard plastic protective case.

Calculations and submittal data shall be provided with the permit application permitting evaluation of the system prior to installation. The permit application shall clearly designate the system as being required for compliance, **Per 2010 NFPA 13 Section 22.1.3**

- A signed copy of the completed owner's certificate shall be attached to each set of plans. **2010 NFPA 13 – Section 22.1.4 and Figure A22.1 (b)**
- Provide the name and address of project or tenant where the system will be installed.
- Provide the name, address, and telephone/fax numbers for the designer of the system.
- The submitted plans and calculations shall clearly indicate the design standard(s) and edition such as **2010 Edition NFPA 13**, that were used to prepare the submission.

- The submitted plans shall include a schematic drawing of the fire protection underground showing point of entry into building, size and the length of the pipe, the point of connection to the Delco Water Company main and the location of referenced water flow test. The schematic drawing shall also include the location and the type of all valves, meters, and backflow prevention devices.  
**2010 NFPA 13 – Section 22.1.3**
- 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, and void space shall be indicated on the plans. **2010 NFPA 13 - Section 22.1.3**
- The submitted plans shall clearly indicate total area protected by each system riser on each floor.  
**2010 NFPA 13 – Section 22.1.3**
- The submitted plans shall include a 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.  
**2010 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, related equipment and piping.  
**2010 NFPA 13 – Section 22.1.3**
- The submitted plans shall clearly indicate the location and the type of audible and/or visual alarm devices located inside and outside of the building. **2010 NFPA 13 – Section 22.1.3 and 2011 Ohio Fire Code, Section 903.4.2.**
- The submitted plans shall 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. **2010 NFPA 13 - Section 22.1.3**
- The submitted plans shall clearly indicate the location of all special sprinklers, such as extended coverage, sidewall, intermediate or high temperature sprinklers. **2010 NFPA 13 – Section 22.1.3**
- The submitted plans shall 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 methods to support sprinkler components. **2010 NFPA 13 – Section 22.1.3**
- The submitted plans shall clearly indicate the nominal pipe size and the cutting lengths of pipe, center-to-center dimensions, including riser nipples, drop nipples, and arm over.  
**2010 NFPA 13 – Section 22.1.3**
- The submitted plans shall clearly indicate the method of protection for non-metallic piping as required by pipe manufacturer (nailer plates and/or thermal insulation).  
**2010 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 2010 NFPA 13R – Annex A – Figures A 5.3.2 (a, b, c, d, and e for proper insulation method) 2010 NFPA 13 – Section 8.16.4.1.3



**Hydraulically Designed Systems:**

1. Required hydraulic data nameplate information. 2010 NFPA 13 – Section 22.1.3
  - 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 2010 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. 2010 NFPA 13 – Section 22.1.3
3. The protection areas covered per sprinkler head. 2010 NFPA 13 – Table 8.6.2.2.1 (a, b, c and d)
4. Provide a copy of the Delco Water Company water flow test results, dated within six months of plan submission date. 2010 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 2010 NFPA 13 – Section 22.3.5.1(b)

1. Delco Water Company water flow data
2. Total sprinkler system hydraulic demand including hose streams

**TENANT REMODEL**



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. 2010 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.



Owners certificate shall be required 2010 NFPA 13- Section 4.3

**LIMITED AREA SPRINKLER SYSTEM**

- The submitted plans shall provide a key plan showing the room or space to be sprinklered. 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 **2010 NFPA 13 - Sections 22.2, 22.3 and the 2011 Ohio Fire Code Section 903.3.5.1.1.**
  1. Where the sprinkler system is supplied through a domestic water meter, provide the Delco Water Company Water Meter Sizing Form.
  2. Where the sprinkler system is supplied through a separate fire line connection 2” or smaller in diameter.
- When a control valve is provided downstream from the domestic water control valve the limited area sprinkler system shall be supervised in accordance with **2011 Ohio Fire Code, Section 903.3.5.1.1 - Exception and Section 903.4.**

**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. **2010 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 **2010 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. **2010 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 **2010 NFPA 13 – Section 3.9.2.**
- 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. **2010 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
- 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 \_\_\_\_\_

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.  
**2010 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 **2010 NFPA 13D** – One and Two-Family Dwellings and Manufactured Housing and Limited Area Sprinkler Systems as permitted the **2011 Ohio Fire Code Section 903.4.1 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. **2010 NFPA-72 Section 6.9.3.3**
- The submitted plans shall clearly indicate the make, type, model, and size of all dry pipe valves, pre-action valves, or deluge valves. **2010 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. **2010 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. **2010 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. **2010 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.  
**2010 NFPA 13 – Section 7.6.3.1; Figure 7.6.3.2**
- An approved listed expansion chamber shall be provided on all antifreeze systems.  
**2010 NFPA 13 – Section 7.6.3.3**
- All fire pump and booster fire pump installations shall comply with **2010 NFPA 20 and 2011 Ohio Fire Code Section 913**

## **HYDRAULIC CALCULATION FORMS**

### **Non- Computer Generated Hydraulic Calculations**

- Hydraulic calculations shall be prepared on form sheets that include a summary sheet, detailed worksheets, and a graph sheet. **2010 NFPA 13 - Figures A22.3.5.1 (a), A22.3.5.1.2(b) and A22.3.5.1 (c)**
- 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. **2010 NFPA 13 - Section 22.1.3**
- 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. **2010 NFPA 13 - Section 22.1.3**
  2. The maximum area of coverage per sprinkler. **2010 NFPA 13 – Section 22.1.3**
  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. **2010 NFPA 13 – Section 22.1.3**
- Graph sheet: A graphic representation of the hydraulic demand shall be plotted on graph paper ( $Q^{n1.85}$ ) or computer generated hydraulic program based upon:**
  1. The Delco Water Company flow data
  2. The total sprinkler system hydraulic demand including the in-rack demand and the inside and outside hose streams requirements. **2010 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. **2010 NFPA 13 - Section 22.1.3 and the 2011 Ohio Fire Code - Section 903.3.5.1.**

### **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. **2010 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 **2010 NFPA 13 - Figures 22.3.5.1 (a, b, c, and d).**

### **STATE OF OHIO LICENSE**

- Attach a copy of the State of Ohio Fire Marshal Companies Sprinkler License and all Installing Contractors License for this job. **Per 2011 Ohio Fire Code Section 915.1 thru 915.26**

### **COPY OF AS BUILT SPRINKLER PLANS ON SITE**

- A full set of as-built plans shall be placed in a water resistant tube and the tube shall be permanently affixed to the wall in the sprinkler room.