

**SECTION 21 1300**  
**FIRE SUPPRESSION SPRINKLERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. Dry-pipe sprinkler system.
- C. Pre-action sprinkler system.
- D. System design, installation, and certification.
- E. Fire department connections.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 08 3477 - Smoke Control Curtain Assemblies: Smoke and fire curtains to be released by activation of sprinkler system.
- C. Section 14 9100 - Facility Chutes: Sprinkler heads inside chutes.
- D. Section 21 0500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION: Pipe, fittings, and valves.
- E. Section 21 0523 - General-Duty Valves for Water-Based Fire-Suppression Piping.
- F. Section 21 0548 - Vibration and Seismic Controls for Fire Suppression Piping and Equipment.
- G. Section 21 0553 - Identification for Fire Suppression Piping and Equipment.
- H. Section 21 1200 - Fire-Suppression Standpipes.
- I. Section 21 3000 - Fire Pumps.
- J. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
- K. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- L. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.
- M. Section 28 3100 - Fire Detection and Alarm.

**1.03 REFERENCE STANDARDS**

- A. FM (AG) - FM Approval Guide; current edition.
- B. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2012.
- C. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements; 2012.
- D. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2013.
- E. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2013.
- F. ITS (DIR) - Directory of Listed Products; current edition.
- G. NFPA 13 - Standard for the Installation of Sprinkler Systems; 2016.
- H. NFPA 13R - Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies; 2016.
- I. NFPA 1963 - Standard for Fire Hose Connections; 2014.
- J. UL 405 - Fire Department Connection Devices; Current Edition; Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
  1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
  2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
  3. Submit shop drawings to authorities having jurisdiction for approval. Submit proof of approval to Architect.
- D. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
- E. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
  3. Sprinkler Wrenches: For each sprinkler type.

#### **1.06 QUALITY ASSURANCE**

- A. Conform to FM (AG) requirements.
- B. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in Michigan.
- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience and approved by manufacturer.
- E. Equipment and Components: Provide products that bear FM (AG) label or marking.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Sprinklers, Valves, and Equipment:
  1. Tyco Fire Protection Products, a Tyco Business; \_\_\_\_\_: [www.tyco-fire.com](http://www.tyco-fire.com).
  2. Viking Corporation; \_\_\_\_\_: [www.vikinggroupinc.com](http://www.vikinggroupinc.com).
  3. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 SPRINKLER SYSTEM**

- A. Sprinkler System: Provide coverage for entire building.
- B. Occupancy: Light hazard; comply with NFPA 13.
- C. Water Supply: Determine volume and pressure from water flow test data.
- D. Provide fire department connections where indicated.
- E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.
- F. Pipe Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
  1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
  2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
  3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.

4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.

### 2.03 SPRINKLERS

- A. Suspended Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate.
  1. Response Type: Quick.
  2. Coverage Type: Standard.
  3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- B. Exposed Area Type: Pendant type with guard.
  1. Response Type: Quick.
  2. Coverage Type: Standard.
  3. Finish: Brass.
  4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- C. Dry Sprinklers: \_\_\_\_\_ pendant type with matching push on escutcheon plate.
  1. Response Type: Quick.
  2. Finish: Brass.
  3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- D. Storage Sprinklers: Pendant type with guard.
  1. Response Type: Standard.
  2. Coverage Type: Standard.
  3. Finish: Chrome plated.
  4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- E. Guards: Finish to match sprinkler finish.
- F. Flexible Drop System: Stainless steel, multiple use, open gate type.
  1. Application: Use to properly locate sprinkler heads.
  2. Include all supports and bracing.
  3. Provide braided type tube as required for the application.
  4. Manufacturers:
    - a. Victaulic Company; Vic-Flex: [www.victaulic.com](http://www.victaulic.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

### 2.04 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
  1. Activate electric alarm.
  2. Test and drain valve.
  3. Replaceable internal components without removing valve from installed position.
  4. Manufacturers:
    - a. Victaulic Company; Series 751 with Series 760 motor alarm: [www.victaulic.com](http://www.victaulic.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm, accelerator, and with the following additional capabilities and features:
  1. Activate electric alarm.
  2. Test and drain valve.
  3. Externally resettable.
  4. Replaceable internal components without removing valve from installed position.
  5. Manufacturers:
    - a. Victaulic Company; Series 768 - NXT: [www.victaulic.com](http://www.victaulic.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Preaction Valve:

1. Operated by detection system listed for releasing service and independent of building fire alarm system with provisions for local, manual, and indicated remote releases.
  2. Incorporate mechanical latching mechanism incorporating valve clappers independent of system water pressure fluctuations.
  3. Provide test detection device for each actuation circuit adjacent to each controlled valve in accordance with NFPA 13.
- D. Backflow Preventer: Reduced pressure principle valve assembly backflow preventer with drain and OS & Y gate valve on each end.
- E. Test Connections:
1. Inspector's Test Connection for Preaction Systems:
    - a. Provide test connections approximately 6 ft above floor for each or portion of each sprinkler system equipped with an alarm device, located at the most remote part of each system.
    - b. Route test connection to an open-site drain location, excluding janitor sinks, accepting full flow without negative consequences.
    - c. Supply discharge orifice with same size as corresponding sprinkler orifice.
    - d. Limit vertical height of exterior wall penetration to 2 ft above finished grade.
  2. Backflow Preventer Test Connection:
    - a. Provide downstream of the backflow prevention assembly, listed hose valves with 2.5 inch National Standard male hose threads with cap and chain.
    - b. Furnish one valve for each 250 gpm of system demand or fraction thereof.
    - c. Provide permanent sign reading "Test Valve" in accordance with Section 22 0553.
- F. Electric Alarm: Electrically operated chrome plated gong with pressure alarm switch.
- G. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- H. Fire Department Connections:
1. Type: Free standing made of corrosion resistant metal complying with UL 405.
    - a. Inlets: Two way, 2-1/2 inch swivel fittings, internal threaded. Thread size and inlets according to NFPA 1963 or Authority Having Jurisdiction. Brass caps with gaskets, chains, and lugs.
    - b. Rated Working Pressure: 175 psi.
    - c. Finish: Chrome.
    - d. Sleeve: Brass, 18 inches height.
    - e. Signage: Raised or engraved lettering 1 inch minimum indicating system type.
    - f. Manufacturers:
      - 1) Elkhart Brass Manufacturing Company, Inc; \_\_\_\_\_: [www.elkhartbrass.com](http://www.elkhartbrass.com).
      - 2) Fire End & Croker Corporation; \_\_\_\_\_: [www.croker.com](http://www.croker.com).
      - 3) Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 PREACTION VALVE CONTROL PANEL

- A. Provide a modular type control panel for electrically operated detection and extinguishing systems for each preaction valve.
1. Factory mount in surface mounted, steel cabinet with hinged doors, and cylinder lock.
  2. Provide factory wired assembly containing components and equipment as required to perform specified system operating and supervisory functions.
  3. Include isolation switch to allow system testing without activation of the preaction valve.
  4. House batteries in separate and lockable, steel cabinet.
  5. Finish interior and exterior of cabinet with enamel paint and provide identification plates in accordance with Section 22 0553.
  6. Provide 120 volt AC service transformed through a two-winding, isolation type transformer and rectified to low voltage DC for operation of all system actuating, signal sounding, trouble signal, and fire alarm tripping circuits.

7. Provide UL (DIR) listed as an extinguishing system releasing panel and separate from the building's fire alarm control panel.
- B. Secondary Power Supply:
  1. Provide nickel cadmium rechargeable storage batteries and battery charger.
  2. Storage Batteries:
    - a. Provide with sufficient ampere-hour rating to operate under supervisory and trouble conditions, including audible trouble signal devices under alarm conditions for an additional 10 minutes and as required in accordance with the equipment listing.
    - b. Prevent contact between terminals of adjacent cells, battery terminals, and other metal parts with separate cell construction.
  3. Battery Charger:
    - a. Provide solid state automatic two rate type, capable of recharging completely discharged batteries to fully charged condition in 24 hours or less.
    - b. Locate charger within control panel or battery cabinet.
- C. Wiring: Refer to Section 26 2717.
- D. Supervision: Refer to Section 28 3100.

## **2.06 PRESSURE MAINTENANCE PUMP**

- A. Type: Close coupled motor and positive displacement pump unit.
- B. Construction: Bronze with stainless steel shafts, carbon bearings.
- C. Motor: Open drip proof, permanently lubricated.
- D. Electrical Characteristics:
  1. 0.33 hp.
  2. 115 volts, single phase, 60 Hz.
- E. Accessories: Include flexible hose connections.
- F. Operation: Manual.

## **2.07 AIR COMPRESSOR**

- A. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
- B. Electrical Characteristics:
  1. 1/3 hp.
  2. 125 volts, single phase, 60 Hz.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Provide approved backflow preventer assembly at sprinkler system water source connection.
- D. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- E. Locate outside alarm gong on building wall as indicated.
- F. Place pipe runs to minimize obstruction to other work.
- G. Place piping in concealed spaces above finished ceilings.
- H. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- I. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- J. Install air compressor on vibration isolators. Refer to Section 22 0548.
- K. Flush entire piping system of foreign matter.

- L. Install guards on sprinklers where indicated.
- M. Hydrostatically test entire system.
- N. Require test be witnessed by Fire Marshal.

### **3.02 INTERFACE WITH OTHER PRODUCTS**

- A. Ensure required devices are installed and connected as required to fire alarm system.

### **3.03 SCHEDULES**

- A. System Hazard Areas:
  - 1. Offices: Light Hazard.
  - 2. Warehouse: Ordinary Hazard, Group 2.
  - 3. Computer Room: Light Hazard, Pre-action.
- B. Sprinklers:
  - 1. Drawing Code:
  - 2. Manufacturer:
  - 3. Model:
  - 4. Location:
  - 5. Temperature Rating:
  - 6. Finish:
  - 7. Style:

**END OF SECTION 21 1300**