

## SECTION 15300

### FIRE PROTECTION SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SCOPE

- A. It is the intent of these specifications to provide a sprinkler system for the new addition and the adjoining two story classroom building.
- B. The sprinkler system requirements include:
  - 1. System shall comply with NFPA 13, suitable for light and ordinary hazard occupancies as required.
  - 2. The system shall be wet.
  - 3. Provide a 250 gpm hose stations allowance in Gymnasium.
  - 4. Piping in areas with ceilings shall be concealed.
  - 5. Sprinkler heads in the locker rooms shall be recessed and concealed.
  - 6. To avoid asbestos abatement within existing classroom ceilings, sprinkler mains shall be run within the corridor and extended coverage sidewall heads shall be used on the ground and first floor levels.
  - 7. Provide sprinkler protection above ceilings where bundled wires and cable trays exist.
  - 8. Provide sprinkler protection below any obstruction 48" or wider, such as ducts or shelving.
  - 9. All sprinkler piping shall be run level with low point drain valves for any trapped pipe sections. One low point drain valve shall be provided in each wing of the building.
- C. The Contractor shall check the Architectural, structural, mechanical, electrical and associated plans and specifications to assure proper coordination with the other trades. The contractor is responsible for visiting the site before bidding to gain first hand knowledge of the systems
- D. Sprinkler work shall be done by High Tech Fire Protection, Sprinkler Systems, Inc., Eastern Sprinkler Services or SimplexGrinnell.
- E. Contractor shall verify water pressures and flows available at site and prepare hydraulic calculation of the fire protection systems in compliance with NFPA.
- F. Interface system with building control, building fire and smoke alarm system.

##### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting - of any pipe.
- B. Electrical wiring.

##### 1.3 CODE COMPLIANCE

- A. NFPA Compliance: Install fire protection systems in accordance with NFPA 13 "Standard for the Installation of Sprinkler Systems" (and NFPA 14 "Standard For Installation of Standpipe and Hose Systems.)
- B. UL Compliance: Provide fire protection products in accordance with UL standards; provide UL label on each product.
- C. Screw Thread Connections: Comply with local fire department/marshal regulations for sizes, threading and arrangement of connections for fire department equipment to fire protection systems.

#### 1.4 SUBMISSIONS

- A. Submittals: Submit manufacturer's technical product data and installation instructions for fire protection materials and products.
- B. Approval Drawings: Prepare approval drawings of fire protection systems indicating pipe sizes, pipe locations, fittings, shut-offs, equipment, etc. Submit to Agency having jurisdiction for approval. Submit one approved copy, bearing stamp and/or signature of Agency having jurisdiction, before proceeding with installation.
- C. Approval Calculations: Prepare hydraulic calculations of fire protection systems. Submit to Agency having jurisdiction for approval. Submit one approved copy, bearing stamp and/or signature of Agency having jurisdiction, before proceeding with installation.
- D. Certificate of Installation: Submit certificate upon completion of fire protection piping work which indicates that work has been tested in accordance with NFPA 13, and also that system is operational, complete, and has no defects.
- E. Maintenance Data: Submit maintenance data and parts lists for fire protection materials and products. Include this data, product data, shop drawings, approval drawings, approval calculations, certificate of installation, and record drawings in maintenance manual; in accordance with requirements of Division 1.

#### 1.5 QUALITY ASSURANCE

- A. The entire fire protection automatic sprinkler system shall be designed, fabricated, installed, and tested by a Contractor regularly engaged, a minimum of 2 years, in sprinkler installations of similar size and qualified to install sprinkler systems. He shall submit evidence of his qualifications to the Engineer upon request.
- B. In addition to complying with all pertinent codes and regulations, comply with the requirements of the insurance underwriter, NFPA, the Fire Marshal having jurisdiction and the local Fire Chief.

#### 1.6 PERMITS

Apply for, obtain and pay for all permits and inspections required by law and notify proper authorities in ample time for such inspections to be made.

### PART 2 - PRODUCTS

#### 2.1 PIPING MATERIALS AND PRODUCTS

Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in fire protection piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.

#### 2.2 IDENTIFICATION

Provide identification in accordance with the following listing:

- A. Fire Protection Valves - Plastic valve tags.

- B. Fire Protection Signs - Provide the following signs:
  1. At each sprinkler valve, sign indicating what portion of system valve controls.
  2. At each outside alarm device, sign indicating what authority to call if device is activated.
  3. At each hose connection for dry standpipes, sign reading "Dry Standpipe for Fire Department Use Only".
- C. Install fire protection signs on piping in accordance with NFPA 13 requirements.
- D. Heads shall be centered on ceiling tiles.

### 2.3 PIPES AND PIPE FITTINGS

Provide pipes, and pipe fittings in accordance with the following listing:

- A. Black Steel Pipe - Schedule 40 for less than 8"; Schedule 30 for 8" and larger; Class 125, cast-iron threaded fittings and threaded joints or mechanical grooved pipe couplings and fittings; cut-groove type.
- B. Black Steel Pipe - Schedule 10 for 5" and smaller; 0.134" wall thickness for 6"; and 0.188" wall thickness for 8" and 10"; wrought-steel buttwelding fittings and welded joints or mechanical grooved pipe couplings and fittings; roll-groove or mechanical locking type.
- C. Copper Tube - Type M, hard-drawn temper; wrought-copper fittings; solder joints.
- D. Comply with requirements of NFPA 13 for installation of fire protection piping materials. Install piping products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that piping systems comply with requirements and serve its intended purposes.
- E. Coordinate with other work, including plumbing piping, as necessary to interface components of fire protection piping properly with other work.
- F. Install drain piping at low points of piping systems. Provide dry drum drips where required.
- G. Install sectional valves in inlet piping, at bottom of each riser, and in loops as required.
- H. Install fire department connection valves in piping where required.
- I. Install water flow indicators where required.
- J. Install manual shut-off at each audible alarm station.
- K. Install Inspector's test connection at most remote point from riser.

### 2.4 PIPING SPECIALTIES

Provide piping specialties in accordance with the following listing:

- Pipe escutcheons
- Dielectric unions
- Drip pans
- Pipe sleeves
- Sleeve seals
- Fire Barrier Penetration Seals

## 2.5 SUPPORTS AND ANCHORS

Provide supports and anchors in accordance with the following listing:

- A. Adjustable steel clevis hangers, adjustable steel band hangers or adjustable band hangers for horizontal-piping hangers and supports.
- B. Two-bolt riser clamps for vertical piping supports.
- C. Steel turnbuckles and malleable-iron sockets for hanger-rod attachments.
- D. Concrete inserts, top-beam C-clamps, side beam or channel clamps or center beam clamps for building attachments.

## 2.6 VALVES

Provide valves in accordance with the following listing:

- A. Sectional Valves - Gate valves or butterfly valves; UL listed.
- B. Check Valves - Swing check valves; UL-listed.
- C. Alarm Check Valve - Provide cast-iron water flow alarm check valve, 175 psi working pressure.
- D. Fire Department Connection Valves - Provide fire department connection iron swing check valve, 175 psi rated working pressure, of size and end type indicated.
- E. Hose Outlet Valves - Provide angle hose valves 2-1/2" size where required.
- F. Combination Pressure Restricting and Angle Hose Valve - Provide combination pressure restricting and angle hose valve with cast brass body and solid cast aluminum red wheel handle, UL-listed and FM approved.
  - a. Finish - Rough brass.
  - b. Outlet - National standard thread.

## 2.7 METERS AND GAUGES

- A. Provide meters and gauges in accordance with the following listing:
  - 1. Pressure gauges, 0-250 psi range.

## 2.8 FIRE PROTECTION SPECIALTIES

Provide fire protection specialties, UL-listed, in accordance with the following listing. Provide sizes and types which mate and match piping and equipment connections.

- A. Water-Motor Gongs - Provide weatherproof, red enameled finish, water-motor gongs.
- B. Low Air Pressure Horn - Provide low air pressure horn as indicated.
- C. Air-Pressure Maintenance Device, Dry-Pipe System - Provide air pressure maintenance device for dry-pipe standpipe piping as recommended by the manufacturer.
- D. Supervisory Switches - Provide products recommended by manufacturer for use in service indicated.

- E. Fire Protection Specialties Manufacturers - Allen (W.D.); Croker-Standard; Elkhart Brass; Grinnell Fire Protection Systems; Grunau Sprinkler; Guardian Fire Equipment; Potter Roemer; or Western Fire Equipment.
- F. Install fire protection specialties as indicated and in accordance with NFPA 13.  
Furnish wiring requirements to electrical Installer for electrical wiring of supervisory switches.

## 2.9 AUTOMATIC SPRINKLERS

Provide automatic sprinklers in accordance with UL and FM listing. Provide fusible links for 165°F (74°C) unless otherwise indicated.

- Upright
- Pendent
- Vertical sidewall
- Flush pendent
- Flush dry-type pendent
- Standard dry-type pendent
- Standard dry-type upright
- Concealed pendent
- Horizontal sidewall

- A. Finish - Chrome plate for occupied area, cast brass for all other areas.
- B. Sprinkler Cabinet and Wrench - Furnish steel, baked red enameled, sprinkler box with capacity to store 12 sprinklers and wrench sized to sprinklers.
- C. Automatic Sprinklers Manufacturers - Automatic Sprinkler; Grinnell Fire Protection Systems; or Viking.

## 2.10 WALL TYPE SIAMESE CONNECTIONS

Provide wall type cast brass siamese connections and escutcheon plate assembly, with 2, 2-1/2" fire department inlets with female hose connections, American National fire hose connection screw thread, equipped with individual drop clapper valves, equipped with plugs and chains, construction features as indicated, and constructed with the following additional construction features:

- A. Finish - Rough brass.
- B. Inlet Pipe - 4" pipe.
- C. Cast Lettering - "AUTO. SPKR."
- D. Escutcheon - 12" diameter or 7" x 14" rectangular.
- E. Siamese Manufacturers - Croker-Standard; Elkhart Brass; or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Work shall be started as soon as the general construction permits.
- B. All detail of installation is to be done in a neat and workmanlike manner.
- C. Risers are to be plumbed with adjacent construction.
- D. O.S. & Y. gate valves are to be aligned with adjacent walls or partitions to provide maximum clearance.
- E. Contractor shall be responsible for coordinating his work with other trades.

### 3.2 SPRINKLER PIPING FLUSHING

Prior to connecting sprinkler risers for flushing, flush water feed mains, lead-in connections and control portions of sprinkler piping. After fire sprinkler piping installation has been completed and before piping is placed in service, flush entire sprinkler system, as required to remove foreign substances, under pressure as specified in NFPA 13. Continue flushing until water is clear, and check to ensure that debris has not clogged sprinklers.

### 3.3 HYDROSTATIC TESTING

After flushing system, test fire sprinkler piping hydrostatically, for period of 2 hours, at not less than 200 psi or at 50 psi in excess of maximum static pressure when maximum static pressure is in excess of 150 psi. Check system for leakage of joints. Measure hydrostatic pressure at low point of each system or zone being tested.

- A. Dry-Pipe Testing - Test dry-pipe hydrostatically except, in freezing conditions, test with air at pressures not less than 50 psi, for a period of 2 hours. Check system for leakage. Leave differential dry-valve clappers open during test to prevent damage.
- B. Repair or replace piping system as required to eliminate leakage in accordance with NFPA standards for "little or no leakage" and retest as specified to demonstrate compliance.

### 3.4 EXTRA EQUIPMENT

- A. Extra Heads - For each style and temperature range required, furnish additional sprinkler heads, amounting to one unit for every 100 installed units, but not less than 2 units of each.
- B. Extra Wrenches - Furnish 2 spanner wrenches for each type and size of valve connection and fire hose coupling.
- C. Cabinet - Emergency cabinet shall be a 12 capacity standard metal cabinet with head wrench and required spare heads.

### 3.5 QUALIFICATION

- A. This Contractor shall be well qualified by previous experience to complete this installation and may be required to submit evidence of such qualification to the engineers.

### 3.6 GUARANTEE

- A. This Contractor shall guarantee all materials and workmanship to be free from all defects for a period of one (1) year from date of final acceptance, and shall make good, repair or replace any defective work within that time at his own expense and with no cost to the Owner.

END OF SECTION