

SECTION 15300

FIRE PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This section specifies a high rise building combination stand pipe system for future automatic wet sprinkler systems for buildings and structures. Materials and equipment specified in this section include:
 - 1. Pipe, fittings, valves and specialties.
 - 2. Building service and detector check (Backflow prevention).

1.2 RELATED SECTIONS

- A. The following sections contain requirements that relate to this section:
 - 1. Division 15 "Mechanical Identification" for labeling and identification of fire protection piping systems and components.

1.3 DEFINITIONS

- A. Pipe sizes used in this specification are Nominal Pipe Size (NPS).
- B. Other definitions for fire protection systems are listed in NFPA Standards 13, 14, and 20.
- C. Working plans as used in this section means those documents (including drawings and calculations) prepared pursuant to the requirements contained in NFPA 13 and 14 for obtaining approval of the authority having jurisdiction.

1.4 SYSTEM DESCRIPTION

- A. Entire building shall not be protected by an automatic wet pipe, but shall be hydraulically calculated fire sprinkler system and connected to the combined standpipe system.
 - 1. The fire sprinkler system design shall be based on the following:
 - a. Ordinary Hazard - Entire building
 - 2. The fire sprinkler system design shall include a future fire pump system plan layout and diagram.
- B. A combined standpipe system shall be provided for the building as shown. 2-1/2 inch hose valves shall be installed at every floor level and roof levels as indicated on the drawings, and be able to serve a maximum 100 foot hose with a 30 foot spray throughout entire building. The system shall be provided with a 750 GPM sprinkler booster fire pump and jockey pump, connected to the combined standpipe system, to supply the automatic fire sprinkler systems.
 - 1. Primary source of water shall be from the City water main, and secondary source will be from the Fire Department pumper connections.

1.5 SUBMITTALS

- A. Product data for valve, piping specialty, fire protection specialty, and fire department connection specified.
- B. Shop drawings prepared in accordance with NFPA 13 and 14, identified as "working plans", including hydraulic calculations where applicable, and which have been approved by the authority having jurisdiction.

- C. Maintenance data for valve, piping, specialty, fire protection specialty, fire department connection, for inclusion in operating and maintenance manual specified in Division 1 and Division 15 "Basic Mechanical Requirements".
- D. Welder's qualification certificates.
- E. Test reports and certificates including "Contractor's Material and Test Certificate for Aboveground Piping" and "Contractor's Material and Test Certificate for Underground Piping" as described in NFPA 13.

1.6 QUALITY ASSURANCE

- A. Installers Qualifications: Installations of fire protection piping, equipment, specialties, and accessories, and repair and servicing of equipment shall be performed only by a qualified installer. The term qualified means experienced in such work (experienced shall mean having a minimum of 5 previous projects similar in size and scope of this project), familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction. Upon request, submit evidence of such qualifications to the Architect. Refer to definitions for "Installers". Installer shall have a valid State of California Contractor's License.
- B. Qualifications for welding processes and operators: Comply with the requirements of AWS D10.9, "Specifications for Qualifications of Welding Procedures and Welders for Piping and Tubing, AR-3".
- C. Regulatory Requirements: Comply with the requirements of the following codes:
 - 1. NFPA 13 - Standard for Installation of Sprinkler Systems.
 - 2. NFPA 1963 - Screw Threads and Gaskets for Fire Hose Connections.
 - 3. UL and FM Compliance - Fire protection system materials and components shall be UL listed and labeled, and Factory Mutual approved for the application anticipated.
 - 4. NFPA 14 - Standard for Installation of Standpipe and Hose Systems.
 - 5. NFPA 20 - Standard for Installation of Centrifugal Fire Pumps.

1.7 SEQUENCING AND SCHEDULING

- A. Schedule rough-in installations with installations of other building components.

1.8 EXTRA MATERIALS

- A. As may be required by authority having jurisdiction.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide fire protection system products from one of the following:
 - 1. Gate Valves:
 - a. Fairbanks
 - b. Jenkins
 - c. Kennedy Valve, Div. of ITT Grinnell Valve Co., Inc.
 - d. Stockham
 - e. Milwaukee

2. Grooved Mechanical Couplings:
 - a. Grinnell "Gruvlok"
 - b. Victaulic Company of America
 - c. Gustin-Bacon

3. Fire Department Connection Valve: (use existing or match existing)
 - a. Guardian Fire Equipment, Inc.
 - b. Potter-Roemer
 - c. Elkhart

2.2 PIPE AND TUBING MATERIALS

- A. General: Refer to Part 3, Article "Pipe Applications" for identification of systems where the below specified pipe and fitting materials are used.
- B. Pipe:
 1. Combined Standpipe (Below Ground): Ductile iron, cement lined, thickness class 150.
 2. Combined Standpipe and drain (Above Ground): ASTM A-120, Schedule 40 seamless black steel.

2.3 FITTINGS

- A. Cast iron threaded fittings: ANSI B16.4, standard pattern, for threaded joints. Threads shall conform to ANSI B1.20.1.
- B. Malleable threaded fittings: ANSI B16.3, standard pattern, for threaded joints. Threads shall conform to ANSI B1.20.1.
- C. Steel fittings: ASTM A234, seamless or welded, for welded joints.
- D. Grooved mechanical fittings: ASTM A536, Grade 65-45-12 ductile iron; ASTM A46 Grade 32510 malleable iron; or ASTM A53, Type F or Types E or S, Grade B fabricated steel fittings with grooves or shoulders designed to accept grooved end couplings. All fittings are to be of one manufacturer.
- E. Grooved mechanical couplings: Consist of ductile or malleable iron housing, a synthetic rubber gasket of a central cavity pressure responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure roll grooved pipe and fittings. Grooved mechanical couplings including gaskets used on dry pipe systems shall be listed for dry pipe service. All couplings shall be of one manufacturer.
- F. Cast iron threaded flanges: ANSI B16.1, Class 250; raised ground face, bolt holes spot faced.

2.4 JOINING MATERIALS

- A. Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials appropriate for the wall thickness and chemical analysis of the pipe being welded.
- B. Gasket Materials: Thickness, material, and type suitable for fluid or gas to be handled, and design temperature and pressures.

2.5 GENERAL DUTY VALVES

- A. Gate valves 2 inch and smaller: Body and bonnet of cast bronze, 175 lb. cold water working pressure, non-shock, threaded ends, solid wedge, outside screw and yoke, rising stem, screw in bonnet, and malleable iron handwheel. Valves shall be capable of being repacked under pressure, with valve wide open.

- B. Gate valves 2-1/2 inch and larger: Iron body; bronze mounted, 175 lb. cold water working pressure, non-shock. Valves shall be solid taper wedge; outside screw and yoke, rising stem; flanged bonnet, with body and bonnet conforming to ASTM A125 Class B; replaceable bronze wedge facing rings; flanged ends; and a packing assembly consisting of a cast iron gland flange, brass gland, packing, bonnet, and bronze bonnet bushing. Valves shall be capable of being repacked under pressure, with valve wide open.
- C. Swing check valves: MSS SP-71; Class 175, cast iron body and bolted and conforming to ASTM A126, Class B; horizontal swing, with a bronze disc or cast iron disc with bronze disc ring, and flanged ends. Valve shall be capable of being refitted while the valve remains in the line.

2.6 SPECIALTY VALVES

- A. CSP Roof Outlets: Cast brass body with 6 inch female inlet and two 2-1/2 inch male NPT outlets with 2-1/2 inch CSP hose valves, cap and chain. Potter-Roemer #5877.
- B. Fire Pump Test Header: Cast brass, free standing angle type, 6 x 2-1/2, 3-way, with three 2-1/2 inch non-rising stem gate valve with cap and chain. Potter-Roemer #5867 with #4315 hose gate valves, cap and chain.

2.7 AUTOMATIC SPRINKLERS – NOT PART OF THIS SPECIFICATION

2.8 FIRE DEPARTMENT CONNECTIONS – (USE EXISTING OR MATCH EXISTING)

- A. Connection sizes and 2 ½ inch outlet female inlets, shall be as required, having NH standard threads, for the connection size indicated, as specified in NFPA 1996. Threads shall match local Fire Department Thread Standard. Each inlet shall have a clapper valve, and plug and chain. Provide 18 inch high chrome plated brass sleeve and chrome plated brass sidewalk plated, with words "AUTO SPKR - CSP CONNECTION" in raised letters.

2.9 ALARM DEVICES

- A. General: Types and sizes shall mate and match piping and equipment connections.
- B. Water flow indicators: Vane type water flow detector, rated to 250 psig, designed for horizontal or vertical installation; have 2-SPDT circuit switches to provide isolated alarm and auxiliary contacts, 7 ampere 125 volts AC and 0.25 ampere 24 volts DC; complete with factory set, field adjustable retard element to prevent false signals, and tamper proof cover which sends a signal when cover is removed.
- C. Supervisory switches: SPST, normally closed contacts, designed to signal valve in other than full open position.

2.10 POST INDICATOR VALVES

- A. Post indicator valves: Mueller No. 2070-24, or equivalent, 175#, iron body, bronze mounted, double disc, parallel seats, non-rising stem, indicator post flange, rubber ring joints, NFPA and FM approved gate valves with Mueller No. A-20800, or equivalent, cast iron body, telescopic barrel with flanged bottom section for bolting to valve flange, locking device and operating wrench. UL or FM approved.

PART 3 EXECUTION

3.1 GENERAL

- A. Install piping in a position except pendant type may be installed in the pendant position where necessary because of interference from ducts, beams, light fixtures, etc.
- B. Pipe the drains and test lines to drains.

3.2 VALVE INSTALLATIONS

- A. General: Install fire protection specialty valves, fittings, and specialties in accordance with the manufacturer's written instructions, NFPA 13, and authority having jurisdiction.
- B. Gate Valves: Install supervised open gate valves so located to control all sources of water supply except fire department connections. Where there is more than one control valve, provide permanently marked identification signs indicating the portion of the system controlled by each valve. Refer to Division 15 "Mechanical Identification" for valve tags and signs.
- C. Install check valves in each water supply connection.
- D. Alarm Check Valves: Install check valves in the vertical position, in proper direction of flow including the bypass check valve and retard chamber drain line connection. Install valve trim in accordance with the valve manufacturer's appropriate trim diagrams. Test valve for proper operation.

3.3 FIRE DEPARTMENT CONNECTION INSTALLATIONS

- A. Install automatic drip valves at the check valve on the fire department connection to the mains.
- B. Install mechanical sleeve seal at pipe penetration in outside walls.

3.4 COORDINATION WITH OTHER TRADES

- A. The Contractor shall review the fire sprinkler design and coordinate the shop drawings, identified as "working plans", with other parts of the work, prior to submission to architect for review.
- B. Architect/Engineer will review for concept only. Contractor/Installer shall review for possible conflict with other portions of the work.

3.5 PROTECTIVE COATING UNDERGROUND FITTINGS

- A. Protect joint clamps and other steel items used with underground piping, two coats Kopper's Bitumastic No.50.

3.6 PIPE HANGERS, CLAMPS AND SUPPORTS

- A. Support sprinkler piping from building structure with hangers and support per NFPA Standard No.13. Space the hangers per NFPA No.13, Section 3.15.1 and 3.15.5. Furnish and install intermediate steel supports as required. No "C" clamps permitted.
- B. Attach hangers to roof or floor slabs with concrete inserts. Attach rod or angles with malleable insert and nut. Powder driven studs for hanging up to 2 inch are acceptable, and Hilti drilled expansion anchors for pipes 2-1/2 inch and larger.

3.7 PIPE SLEEVES

- A. Sleeves for pipes through floor slabs shall be standard weight black steel pipe with top of sleeve 3 inch above the floor. Provide 1 inch clearance space around 3-1/2 inch or smaller pipes, and 2 inch clearance around 4 inch and larger pipe.
- B. Sleeves for pipes through walls shall be standard weight black steel pipe or 20-gauge galvanized sheet metal with ends flush with wall surfaces.
- C. Steel pipes passing through walls or slabs, use Dow Corning 3-6548 Silicone RTV Foam, or approved equal.

3.8 JOINTS

- A. Screw joints shall be made up with pipe mastic applied to male threads only. Ream pipe as necessary to make bore at end of pipe the same diameter as with the pipe. Welding of sprinkler pipe is permitted.

3.9 REDUCERS

- A. Reductions in pipe sizes shall be made with one piece reducing fittings. Bushings are not acceptable.

3.10 ESCUTCHEONS

- A. Prime-coated steel setscrew type escutcheons on all exposed pipes passing through finished walls, floors, ceilings and partitions.

3.11 EARTHQUAKE PROTECTION

- A. Provide earthquake protection for sprinkler system in strict accordance with NFPA Pamphlet No.13, Section 3.10.3 and 3.10.3.5.

3.12 SPRINKLER ALARM SWITCH

- A. Provide flow switches, tamper switches and sprinkler alarm bell. Coordinate alarm bell wiring with electrical trade.

3.13 GUARANTEE

- A. All materials, apparatus and equipment furnished and installed hereunder shall be new and unused and free from all defects. Should any trouble develop within one year from date of acceptance of work, due to faulty material and/or workmanship, the trouble shall be corrected by the Contractor without expense to the Owner.
- B. Any building construction and finished parts damaged or removed because of defective sprinkler material or workmanship shall be restored to the satisfaction of the Architect. The cost of all repairs, replacements or alterations and restoration of building construction or finishes shall be borne by the Contractor.

3.14 SIGNS

- A. Control valves, alarm valves, drain and test valves shall be furnished and installed with signs of the standard design adopted by the automatic sprinkler industry in accordance with NFPA No.13 and NFPA No.14.

3.15 INSPECTION AND TESTS

- A. Test installation as required by local Fire Department, NFPA No.13, 14 & 20. Test duration a minimum of four hours and have zero pressure loss. Furnish equipment, materials and labor for tests, and make replacements, alterations and repairs required to obtain approval. All control valves, drain valves and gages shall also be inspected and checked for correct operation by the Contractor and witnessed by the Owner's representative prior to the original occupancy of the building. Pay costs for materials and labor for all trades affected by corrective action. A record of this inspection and certificates of approval shall be provided to the Owner's representative. Any work on sprinklers requiring shutdown after building occupancy, the Contractor shall notify the Owner's representative and obtain a clearance before proceed with any work. The Owner shall be notified 48 hours in advance of tests. Any test conducted without notifying the Owner's representative shall be subject to retest at the discretion of the Owner and at no cost to the Owner.
- B. Leakage:
 - 1. Provide inside sprinkler piping with no visible leakage when the system is subjected to the hydrostatic test.
 - 2. Provide underground mains, lead in piping and common supply piping with no visible leakage when the system is subject to the hydraulic test.

C. Flushing of Underground Connection:

1. Flush underground mains and lead in connections to system risers before connection is made to sprinkler piping, to remove foreign materials which may have entered the underground during the course of the installation.
2. Flush/flow rate, flushing operations and disposal of flowing water shall be as per requirements of UBC Standards Section 38.106(b).

END OF SECTION