

SECTION 15325

SPRINKLER SYSTEM

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish all labor, equipment, materials, and tools and perform all operations in connection with the installation of a complete sprinkler system for all areas of the building. Comply with all codes and authorities having jurisdiction, preparation of Record Drawings and Owner's Manuals, guarantees and warranties, protection of work and quality assurance of workmanship.
- B. The two automobile parking levels will be protected by a dry pipe system. The lower parking level shall be protected by exposed galvanized steel piping. The upper level may be protected by black steel piping. The third floor occupied space shall be protected by a wet pipe system.

1.02 SECTION INCLUDES

- A. All inside sprinkler piping.
- B. Flow switches.
- C. Pressure Switches.
- D. Valves and supervisory devices.
- E. Cold water to 5 feet beyond building and connect to piping provided under other sections of these specifications.
- F. Check valves and trim.
- G. Fire Department connection.
- H. Sprinklers.
- I. Supports, hangers, sleeves and accessories.
- J. Backflow preventer.
- K. Pressure maintenance air compressor.
- L. Tests and certification of tests.

1.03 RELATED SECTIONS:

- A. Section 02200: Earthwork.
- B. Section 09900: Painting.
- C. Section 15190: Mechanical Identification.
- D. Section 15410: Plumbing - General Purpose.
- E. Division 16 - Electric.

1.04 SUBMITTALS

- A. Shop Drawings:
1. Prepare and submit Shop Drawings in accordance with the requirements of Section 01300, and obtain the Architect's approval before proceeding with the fabrication and work.
 2. Show plans, cross section, elevations, details, job conditions, relationship to other work, reflected ceiling plan features, pipe sizes, elevations above floor, head locations, hydraulic design area, hydraulic design calculations, inspectors test connection, sprinkler entrance, valves, alarms, flow switches and supervisory devices.
 3. Shop Drawings and catalog cuts shall indicate Specification Section and paragraph requiring equipment submitted.
 4. Submit data on the following items:
 - a. Piping and couplings.
 - b. Dry Alarm check valves and trim.
 - c. Wet valve riser and trim.
 - d. Backflow preventer.
 - e. Valves and supervisory devices.
 - f. Fire Department connection.
 - g. Sprinkler heads and escutcheon plates.
 - h. Supports, hangers and accessories.
 5. Submit to the Owner's Insurance Underwriter sufficient copies for approval to allow one copy to be incorporated into each Owner's Manual in addition to the required as-built plans.
- B. Samples: Submit samples, with the shop drawing submittal, of each sprinkler head and each escutcheon plate in accordance with requirements of the Conditions of Contract, and before ordering materials, obtain written approval from the Architect.

1.05 HYDRAULIC DESIGN DATA

- A. System Type: Wet pipe for the occupied third floor.
- B. System Type: Dry pipe for the two parking levels.
- C. Building Occupancy: Ordinary Hazard Group 1 for the dry system in the parking areas.
- D. Building Occupancy: Light Hazard for the third floor occupied spaces.
- E. Water Density and Square Foot Requirements: 0.15 gpm over the most remote 1,500 square feet for the dry system in the parking areas.
- F. Water Density and Square Foot Requirements: 0.10 gpm over the most remote 1,500 square feet for the wet system in the third floor occupied areas.
- G. Hose Stream Allowance: 250 gpm for both systems.
- H. Codes and Requirements: NFPA, the Owner's Insurance Underwriter, State Fire Marshal's Office and the local Fire Prevention Officer.

PART 2 PRODUCTS

All products must be either Factory Mutual (FM) or Underwriters' Laboratory (U.L.) listed or both.

2.01 MANUFACTURERS

- A. Equipment: Victaulic, Grinnell, Standard, Viking, Central Sprinkler Corp., Reliable, or equal.

- B. Sprinklers: Viking, Central, Victaulic or approved equal.
- C. Flow Switch, pressure switches and Supervisory Device: Potter Electric Signal Company or equal.
- D. Backflow preventer: Ames or equal.

2.02 MATERIALS

- A. Piping:
 1. Outside Building: Shall be ductile iron pipe and fittings, all cement-lined, Class 52, ANSI C151 and ANSI C104, with a push-on rubber ring gasket compression type joint for pipe and a bolted type mechanical joint for fittings. Provide socket clamps with tie rods at each change in direction, coat with asphaltum or polyethylene wrap. Provide anchors, and thrust blocks, in accordance with NFPA 24.
 2. Inside building: Shall be Schedule 40 black steel, threaded with standard weight iron screw pattern fittings or lightweight, Schedule 10, black steel with mechanical couplings. Install flanged fittings and flanges at valves and where required.
 3. Exposed Dry system piping on the lower level parking area shall be galvanized steel piping, fittings and hangers.
- B. Sprinkler:
 1. Sprinklers shall be rated between 155°F and 165°F, unless otherwise noted or required by Code, and listed as a quick response type head.
 2. Sprinklers:
 - a. Pendant style, white finish, shall be used in all finished areas which have suspended ceilings. Use recessed type escutcheons.
 - b. Concealed style with white finished cover plate for all rooms with gypsum ceilings.
 - c. Dry pendant white finish, semi-recessed escutcheon for the upper parking area.
 - d. Either upright style, bronze finish shall be used in the Mechanical Room and lower level parking area.
 - e. Sidewall style, white finish, 212°F minimum rated heads shall be used at all skylights.
 - f. Sidewall style, bronze finish, 286°F. minimum rated head shall be used in the elevator pit.
 - g. Dry type pendant heads shall be used where recommended by code.
 3. See Drawings for various types and locations of proposed piping and sprinklers.
 4. Provide and install a spare head case per N.F.P.A. 13 requirements. The case shall contain not less than 12 heads total, no less than two of each style of heads and one wrench for each style of head. Locate case in the sprinkler room near the check valve assemblies.
- C. Hangers:
 1. UL listed adjustable hangers, clevis type for 2-1/2" IPS and larger, swivel flat band hangers for 2" IPS and smaller.
 2. Support all piping from the top chord of the bar joists at the "Panel Points" or from the top flange of the beams. 2" and smaller piping may be supported from the bottom chord of the bar joists at the "Panel Points" or from the bottom flange of the beams.
 3. Maximum spacing between hangers per NFPA 13.
- D. Sleeves:
 1. Pipes Through Floors: Form with Schedule 40 (galvanized) steel pipe and extend 1" above surrounding floor.
 2. Pipes Through Interior Fire-rated or Sound-rated Partitions: Form with steel pipe or 16 gauge galvanized steel.
 3. Pipes Through Exterior Building Walls, Concrete Walls or Footing: Form with Schedule 40 (galvanized) steel pipe.
 4. Size: The minimum sleeve diameter shall be either 2 pipe sizes or 2" in diameter larger than the outside diameter of the pipe.

- E. Valves:
 - 1. Riser Control Valves: Butterfly type indicating valves. Cast iron construction.
 - 2. Drain and Test Valves: Bronze body, gate type or ball type, capable of being padlocked in either open or closed position.

2.03 COMPONENTS

- A. Wet Riser Valve and Trim: Wet type check valve, complete with all trimmings and appurtenances, electric alarm, 2-pole flow switch with retard feature to operate the electric alarm and building fire alarm system, drains and test connections.
- B. Dry Pipe Valve and Trim: Dry pipe differential valves with a minimum of 4 to 1 water pressure to air pressure tripping ratio, complete with all trimmings and appurtenances, electric alarm, 2-pole pressure switch to operate the electric alarm and building fire alarm system, drains and test connections.
- C. Pressure Maintenance Air Compressor: Electric driven, single stage, piston type, pipe mounted or floor mounted air compressor. Unit shall be of sufficient capacity to restore normal system pressure within 30 minutes. Provide a two pole pressure switch, a breather valve, a safety relief valve, check valve, unions and isolation valves capable of being padlocked in an open position.
- D. Backflow Preventer: No. 2000SS, double check valve design, all stainless steel construction, renewable seats, strainer, O S&Y type shut-off valves, flanged ends and test connections.
- E. Fire Department Connection: Chrome plated, 4" Storz type, quarter turn connection and wall plate with "Automatic Sprinkler" identification, chrome plated construction. Thread pattern to match that of the local Fire Department equipment; also a 4" UL listed check valve with ball drip piped to drain to the interior floor drain.
- F. Flow Switch: Model # VSR-F vane type waterflow alarm switch with an adjustable retard setting from 10 seconds to 90 seconds having two sets of SPDT contacts for reporting to the building fire alarm system.
- G. Pressure Switches: Model PS-40-2A (Low pressure switch) two sets of contacts, Model PS-10-2A (Pressure switch) two sets of contacts.
- H. Supervision:
 - 1. Electric Supervisory Switch: All valves prior to the alarm check valve shall have a Model # OSYSU-2 electric supervisory device with 2 sets of SPDT contacts to report to the building fire alarm system. Provide on riser control valve prior to the new flow switch.
 - 2. Mechanical: All valves after the alarm check valve shall be padlocked in its standard operating position (either full open or full closed depending upon the function of the valve), with 2 keys per padlock and all padlocks shall be keyed the same.
- I. Finishes:
 - 1. Fire Department connection: Chrome finish.
 - 2. 2" main drain: Galvanized steel pipe and fitting.
 - 3. Alarm Bell: Powder Coated Red enamel.

2.04 ACCESSORIES

- A. Escutcheon Plates: Shall be all metal construction with finish to match the finish of heads and chrome at piping which penetrates walls, partitions, floors and ceilings; 3/8"+ thick by 3-1/4"+ outside diameter. One-piece construction at pendant heads, two-piece adjustable at recessed pendant heads; 2-piece split ring at piping penetrations.

- B. Tags and Charts:
 - 1. See Section 15190: Mechanical Identification.
 - 2. Each valve shall also bear a red enamel sign with white lettering indicating the service or purpose of each valve and the design calculation criteria, secured in place with linked chain.
 - 3. Provide placards in accordance with NFPA 13.

PART 3 EXECUTION

3.01 LOCATIONS OF EQUIPMENT AND APPURTENANCES

- A. All piping shall be run concealed wherever possible.
- B. All branch piping shall be run above the bottom chord of all open joists and trusses.
- C. All sprinklers shall be located in a symmetrical pattern with respect to the light fixtures, diffusers and all other ceiling features and within the center of ceiling tile where tiles occur.
- D. System drains shall be valved and piped to discharge. No valve shall be provided ahead of the electric alarm devices.

3.02 EXAMINATION

- A. Study all Drawings and Specifications, visit the site and become acquainted with the existing conditions and the requirements of the Contract Documents. No claim will be recognized for extra compensation due to failure to become familiarized with the conditions and extent of the proposed work.
- B. All sprinkler work shall avoid proposed locations of and installation clearances for lighting, ducts, piping, framing and equipment. In all cases of conflict, the existing design conditions shall have priority. No compensation will be given for neglect to comply with the above and no claim will be recognized for sprinkler piping, heads and miscellaneous appurtenances which must be modified, removed and reinstalled or relocated, due to conflicts with other work which is or will be installed per the Contract Documents.

3.03 TESTS

- A. The entire installation shall be tested with water and air (independent tests) in accordance with all NFPA requirements, all requirements of the local Fire Department; and the Owner's Insurance Underwriter; this includes the testing of all alarms.
- B. All tests shall be witnessed by the Owner's representative and local Fire Prevention Officer. Submit copies of all test certificates, properly signed, to the Architect.

3.04 CLEANING

- A. At the completion of work, clean the exterior of all exposed piping in all rooms of oil, grease, dirt, and other substances, suitable to accept a prime coat of paint.

END OF SECTION