

SECTION 210000
FIRE SPRINKLER SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Division.

1.2 GENERAL MECHANICAL PROVISIONS

- A. The preceding General Mechanical Provisions shall form a part of this Division with the same force and effect as though repeated here.

1.3 SCOPE

- A. General: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The entire project area shall be fire sprinklered. Where demolition occurs if applicable, remove all equipment, piping, braces, supports and related items no longer required.
- B. Design/Calculations: The sprinkler system shall be designed and sized (by hydraulic calculations for mains) in accordance with NFPA No. 13 and fire authority requirements. Calculations shall be included in submittals.
- C. Preparation of Drawings and Material Data Sheets: Before starting work, complete shop drawings showing locations and sizes of all sprinkler heads, piping, valves, etc., shall be prepared. Shop drawings shall also include material data sheets giving manufacturer's name and catalog numbers, equipment descriptions giving dimensions, capacities, performance curves, and complete layouts. Exposed piping shall be specifically noted on shop drawings.

1.4 DEFERRED APPROVAL SUBMITTAL REVIEW PROCESS

- A. Submit shop drawings, calculations and material data sheets to Engineer for review.
- B. Submit to VA for approval.
- C. Material or equipment shall not be ordered, nor shall work proceed until written review is processed by the Engineer and approved by VA.

PART 2 - PRODUCTS

2.1 STANDARDS

- A. All materials shall be in accordance with NFPA No.13 "Standard for the Installation of Sprinkler Systems" and NFPA No. 14 "Standard for the Installation of Standpipe and Hose Systems".

2.2 PIPING MATERIALS

- A. General: The pressure rating of all piping, valves, flanges and other piping accessories shall be in accordance with code and fire authority requirements. Pressure ratings shall exceed the highest possible working pressure.
- B. Piping:
 - 1. Above Grade:
 - a. 2" and Smaller: Threaded black steel pipe, ASTM A53, A135 or A795, minimum wall thickness per NFPA 13. 175 psi WOG (min.) black cast iron threaded fittings, UL listed.
 - b. 2-1/2" and Larger: Welded black steel pipe, ASTM A53, minimum wall thickness per NFPA 13. Standard weight carbon steel welding fittings, ANSI B16.9. Roll grooved pipe couplings may be used for assembling welded sections.
 - c. Standpipes: Shall comply with NFPA No. 14 and fire authority.
- C. Gate Valve:
 - 1. 2" and Smaller: All bronze, rising stem. UL listed.
 - 2. 2-1/2" and Larger: Iron body, bronze mounted, outside screw and yoke. UL listed. (UL listed butterfly valves may be substituted for 4" and larger gate valves above grade.)
- D. Check Valve:
 - 1. 2" and Smaller: All bronze swing check. UL listed.
 - 2. 2-1/2" and Larger: Iron body, bronze mounted swing check. UL listed.
- E. Standpipe Valves: Shall comply with NFPA No. 14 and fire authority.

2.3 SPRINKLER HEAD

- A. Automatic sprinkler head, semi-recessed (Central Sprinkler Corp., Model A) in areas with finished ceilings, standard heads elsewhere. UL listed. Temperature ratings shall be in accordance with NFPA No. 13. Provide extra heads (of each type installed) in accordance with code requirements. Heads installed with deflector lower than 7'-6" above floor shall have wire guards. Heads shall have chrome finish in areas with finished ceilings and standard finish in areas with exposed piping. Heads installed in areas with finished ceilings shall have metal escutcheons with same finish as head.

2.4 ALARM VALVE ASSEMBLY

- A. Standard wet type alarm valve assembly and water motor gong complete with retarding chamber and trim as required by the authority having jurisdiction. Provide flow switch for connection to alarm system. Provide tamper switch. UL listed.

2.5 POST INDICATOR VALVE

- A. UL listed valve with lockable operating handle, tamper switch and target visible through a glass covered post, reading either "OPEN" or "SHUT".

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. General: Piping shall be concealed in walls, above the ceilings or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location shall be approved by the Engineer. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. Depth of cover in traffic areas shall be 36 inches minimum.
- B. Standards: All piping shall be installed in accordance with NFPA No. 13 "Standard for the Installation of Sprinkler Systems". Underground mains shall be installed in accordance with NFPA No. 24 "Standard for the Installation of Private Fire Service Mains and Their Appurtenances". Standpipes shall be installed in accordance with NFPA No. 14 "Standard for the Installation of Standpipe and Hose Systems".
- C. Miscellaneous:
 - 1. Escutcheons: Provide chrome plated escutcheons where piping penetrates walls, ceilings or floors in finished areas.
 - 2. Pattern: Sprinklers shall be installed in a symmetrical pattern with lighting fixtures and with ceiling pattern. Heads located in lay-in ceilings shall be centered in panel.
 - 3. Pipe Sleeves: All piping passing through concrete shall be provided with pipe sleeves. Allow 1" annular clearance between sleeve and pipe for piping 3" and smaller and 2" annular clearance for piping 4" and larger. Piping through walls below grade shall be sealed with Link-Seal.
 - 4. Access: Provide access doors as required for all valves, devices, etc.
 - 5. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated walls, floors, ceilings, partitions, etc. shall have the annular space surrounding the pipe, or pipe insulation sealed with fire rated materials in accordance with the requirements of the fire authority having jurisdiction.
 - 6. Concrete Thrust Blocks: Shall be constructed at all valves, tees, elbows, bends, crosses, reducers and dead ends in loose-joint pipe. Blocks shall cure a minimum of 7 days before pressure is applied. Concrete shall be 2500 psi mix.

7. Electrical Equipment: Piping shall not be run over electrical panels, motor control centers or switchboards.

3.2 IDENTIFICATION

- A. All controls, piping, valves and equipment shall be labeled for function and service in accordance with NFPA No.13.

3.3 TESTS AND ADJUSTMENTS

- A. Unless otherwise directed, tests shall be witnessed by a representative of the Engineer and an inspector of the authority having jurisdiction. Contractor shall notify fire authority at least 48 hours prior to testing. At various stages and upon completion, the system must be tested in the presence of the enforcing agency. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and the entire work retested. Test all systems in accordance with fire authority requirements and NFPA No.13. Test all pumps in accordance with NFPA No. 20.

3.4 ADDITIONAL TESTING AND DRAINING OF THE SYSTEM

- A. In addition to the above described testing, the pre-action system shall also be given a one-time test to introduce water into the mains for the purpose of determining the length of time required for water to reach the most remote area. The Contractor shall completely drain the system after this test, including draining the drop nipples to pendent heads by removing those heads. The OS & Y valve on the discharge of the alarm valve assembly is to be closed for all subsequent tests of the trip mechanism. No water shall be introduced into the piping system downstream of this OS & Y valve after the initial test. Coordinate all testing with the fire authority. The system shall be air tested after this test.

3.5 CERTIFICATION

- A. At completion of the project, a certificate of inspection from authority having jurisdiction indicating installation and testing in accordance with referenced standards shall be delivered to the Owner through the Engineer.

END OF SECTION