

SECTION 15510

AUTOMATIC FIRE SPRINKLER SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Includes design, fabrication and installation of a complete and operational automatic fire
- B. sprinkler and standpipe system. Includes fire pump.
- C. The system shall be zoned by floor; no exceptions.
- D. In all unheated areas, including attics and canopies, meet the requirements for a 'dry type' installation as set forth in NFPA No. 13.
- E. Provide panels for access to valves for service or testing in enclosed ceiling and walls.

1.02 SUBMITTALS

- A. Provide approval of all authorities prior to commencement of any work.
- B. Shop Drawings: Prepare and submit complete shop drawings for materials to be provided under this section. Shop drawings shall show all piping, sizes, materials, hanger locations, sprinkler head locations, routing of piping and other apparatus around interfering structural elements and all other pertinent data. Refer to Section 01340 for direction for preparation and submission. Submit drawings to governing agencies as required, for their review and approval, submit proof of approval from governing agencies to Architect with submittal. Such shop drawings shall bear the seal of a registered engineer licensed in the State that the project is constructed.
- C. Product Data: Provide detail cut sheet on all material and equipment to be used, such as, sprinkler heads, pipe, fittings, hangers, valves, etc.
- D. Samples: Submit sample of sprinkler heads for approval by the Architect in accordance with Section 01340. Do not order products or materials until samples have been approved in writing by the Architect.
- E. Record Drawings: Provide record drawings and equipment data to Owner and hotel engineer in accordance with Sections 01700 and 01720.

1.03 QUALITY ASSURANCE

- A. The fire protection contractor shall be responsible for all code research, design, coordination and installation of a complete and functional hydraulically calculated sprinkler system and standpipe system that meets the approval of and complete and functional hydraulically calculated sprinkler system and standpipe system that meets the approval of and is in accordance with all applicable regulations and requirements as further specified:
 - 1. The current editions of NFPA Standards #13, #14, #20 and #72.
 - 2. Factory Mutual 2-8N.
 - 3. Applicable Local and/or State Codes.
 - 4. Authorities having jurisdiction and Owner insurance company.
 - 5. System shall be zoned by floor; no exceptions.

- B. Acceptable Manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
1. Valves: Crane, Grinnell, Hammond, NIBCO, Kennedy, Milwaukee.
 2. Flow Alarm Valve: Viking, Grinnell, Automatic, Central.
 3. Flow Switches: Viking, Grinnell, Automatic, Potter-Roemer.
 4. Control Valves: Viking, Grinnell, Automatic, Central, Milwaukee. 1405 / Hampton Inn - Nash. Gateway 15510 - 1 AUTOMATIC FIRE SPRINKLER SYSTEM
 5. Escutcheons: Grinnell, Central, Reliable.
 6. Heads: Fast response, fully concealed, glass bulb type as manufactured by GEM, Central, Reliable.
 7. Fire Pump: Peerless, Aurora, Fairbanks Morse, Allis Chalmer.
 8. Jockey Pump: Peerless, Aurora, Fairbanks Morse, Allis Chalmer.
 9. Controller: GE, Metron, Westinghouse, Firetrol.

1.04 APPROVALS

- A. The contractor shall be responsible for obtaining all permits and approvals of the fire protection system.
- B. This system shall be hydraulically calculated complying with NFPA Standards, State, local and insurance underwriter. Sprinkler Contractor shall provide computerized hydraulic calculations, with shop drawings. Submittals shall include flow tests. Indicate GPM requirements with these calculations. Calculations and shop drawings shall bear the seal of a licensed professional engineer licensed in the State that the project is constructed.
- C. Before commencement of installation, provide Owner's Insurance Company and local and State Fire Marshall with two (2) sets each of plans, calculations and equipment data for review and approval.
1. All submittal data shall be bound in sets and submitted at one time. Partial submittals will be rejected.
 2. The Contractor shall not proceed with any work without final approved submittal bearing all approved stamps.
 3. Contractor shall submit shop drawings bearing the approval of governing authorities to the
 4. Architect for review. Do not submit to Architect without approval of governing authorities.
- D. Upon substantial completion, this work shall be inspected for approval by authorities having jurisdiction.

1.05 COORDINATION

- A. Design documents are provided for information only. The Contractor shall be responsible for actual layouts, routing of piping and additional sprinkler heads to meet all requirements.
- B. The Contractor shall arrange and/or conduct the flow test and coordinate its validity with Owner's Insurance Company.

1.06 TRAINING

- A. The Contractor shall provide training to the hotel engineering staff in the maintenance and operation of the system.

PART 2- PRODUCTS

2.01 MATERIALS

- A. Piping:
 - 1. Class I, schedule 40 ASTM A 120 black steel piping for branches and Class I schedule 10 ASTM A 120 black steel for mains. Thin wall steel pipe and CPVC plastic piping may be used as alternates, only upon approval as alternate materials per governing authorities and as permitted by U.L. listings. Dry systems shall have galvanized piping.
 - 2. Pipe Outside Building: Ductile iron, cement-lined pressure pipe or PVC, C900, if acceptable by State and governing authorities.
- B. Sprinkler Heads: Provide fast response sprinkler heads fully concealed in habitable spaces and with flush white coverplate. Provide standard 212D-F sprinkler heads in ventilated attics, 286D-F in unventilated attics.
 - 1. Back-of House areas, Mechanical, Linen, laundry, Storage, Electric, Computer or
 - 2. Telephone Rooms: Standard 212EF heads.
 - 3. All areas with finished ceiling shall be protected by fully concealed sprinkler heads and
 - 4. cover plate.
 - 5. Provide corrosion-proof heads in all areas of Hampton Inn & Suites.
- C. Spare sprinkler heads in a suitable steel cabinet hinged door and latch, including a sprinkler wrench, shall be provided in accordance with NFPA Standard # 13. All types, sizes and ratings of sprinkler heads installed in the building shall be included. Cabinets shall be finished in red enamel and be wall mounted as directed by Owners Representative.
- D. Hangers and Clamps: Wrought-iron U-type, or adjustable type, shall be tested and listed or approved by U.L. or F.M.
- E. Alarm Valve: Valves shall be furnished for vertical installation and shall be cast iron, complete with retard chamber port to alarm, pressure gauges, main drain, electric alarm flow switch with dual contact on switch suitable for either open or closed circuit.
- F. Water Motor Alarm: Water operated rotating motor assembly connected to an exterior 8" chrome plated gong. Motor discharge shall extend through the wall and terminate at the gong.
- G. Siamese Connection: Cast brass two-way inlet body with drop clappers, pin lug swivels and plugs and chains.
- H. Valve System: Every valve used in an automatic sprinkler system should be tested by a recognized testing laboratory and be listed or approved for its intended use. All valves on connections to water supplies and in supply pipes to sprinklers should be outside screw and yoke or indicator type. Gate valves that control water supplies must be accessible and if necessary permanently fixed ladders should be provided. Such valves shall also have tamper switch wired to alarm panel to prevent tampering by an authorized persons.
- I. Valves/Products
 - 1. Gate Valves: AWWA, non-rising stem, open right, with C.I., two-piece, screw type valve
 - 2. box lid.
 - 3. Check Valves: Swing type, gravity operated, 175 psig w.p.
 - 4. Post Indicator Valves: F.M. approved, adjustable indicator posts. Supply one 6" valve
 - 5. operating wrench with each valve.
 - 6. Valves controlling sprinkler systems shall be provided with means to be locked "OPEN".
- J. Water Supply:
 - 1. Refer to Drawings.
 - 2. All wiring and alarm devices shall be provided by the electrical contractor.
 - 3. The system shall be capable of providing the established fire flow while maintaining the
 - 4. required residual pressure at the highest sprinkler on the system.

- K. Jockey Pump:
1. Pump shall be close-coupled, turbine, bronze fitted type with mechanical seal. Impeller shall be hydraulically balanced bronze, self centering. Pump shall have a stainless steel shaft, replaceable channel rings and cast iron casing. Motor shall be squirrel cage induction, ball bearing type, sized for continuous operation.
 2. Pump controller shall be U.L. listed, built to NEMA industrial standards, factory wired and tested. Control panel shall include: H-O-A selector switch, fusible disconnect, thermal overload relays, pressure switch, reset button, magnetic motor contactor, running period timer, and NEMA 1 enclosure. Entire unit shall have factory painted finish.
 3. Compound pressure gauges shall have 4-1/2" dial, brass case pressure type, located on the suction and discharge pipe of the pump.
 4. Relief Valve: 3/4" Valve on discharge line of pump with relief valve to floor drain.
- L. Fire Pump:
1. Pump shall be horizontal, base mounted, split case, double suction type having 250 pound working pressure cast iron casing with renewable wearing rings and cast iron drip rim base. Impeller shall be bronze enclosed type fastened to steel shaft having bronze sleeves, ball bearings and stuffing boxes. Pump and motor shall be connected with a flexible coupling, shafts carefully aligned after pump base is grouted in place. Motor shall be sized for continuous duty operation, squirrel cage induction, ball bearing type. All bearings shall be fitted with grease lubrication fittings. Pump shall be constructed and equipped in accordance with the standard specifications and requirements of Underwriter's Laboratories, Inc., Factory Mutual Engineering, National Fire Protection Association and local codes and ordinances. Pump performance shall be tested and a certified copy of the test delivered to the Architect. Pump shall be equal to Aurora manufacture.
 2. Pump controller shall conform to NFPA Pamphlet 20, be U. L listed, and approved by Factory Mutual Engineering Corporation. Controller shall include circuit breaker, manual start and stop switch, power service indicator light, control relays for automatic start from pressure switch, motor contactor, external emergency start lever, pressure switch, running period timer, and NEMA 1 enclosure. Unit shall have factory painted finish.
 3. Pump alarm panel shall have current failure and pump operating alarm with visible and audible indicating signal field wiring to the fire pump controller. Installation of supervision service wiring to operate alarms shall be in accordance with Section 16100.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with approved shop drawings and manufacturer's directions.
- B. Connect water piping to the supply main and extend to the sprinkler system.
- C. Hangers and Clamps for piping shall be hung independently of the ceiling.
- D. Horizontal branch piping shall be pitched to main which shall also be pitched to provide complete drainage at drain valve drain.
- E. Flanged joints shall be made with neoprene gaskets and assembled with machine bolts.
- F. Seismic Requirement: Provide swing joint at the top of the sprinkler head extension that can accommodate one-inch movement in all horizontal directions.
- G. Set siamese connection at least 2'-6" from hose inlet centerline to grade. Provide discharge drain line.
- H. Furnish a cabinet with six (6) heads of each type and with tools necessary for removing and replacing the heads. The heads and tools shall be contained in a metal carrying case.
- I. Fire protection system shall be designed, installed and supported so as to resist all applicable forces.
- J. A threaded cap connection shall be located at the end of each sprinkler piping run to flush the system.

- K. Locate wet pipe inspector test valve and associated sight glass as noted on Drawings. Hard pipe drain of sight glass to drain. Termination of drains shall be in accordance with all State and local requirements.
- L. Locate indicating control valves and appurtenances as noted on the Drawings.
- M. Refer to Section 10520 for fire hose valve cabinets and fire extinguishers.
- N. Install basket type metal guards over sprinkler heads to protect them from damage in Laundry, Mechanical, Electrical and Storage Rooms.
- O. Inspector test assemblies are required. Locate at remote ends of systems, and hard pipe discharge to exterior of building. Discharge shall not be directed onto sidewalks or landscaping.
- P. Flushing and Testing: The completed system shall be tested by the installer in the presence of a representative of the Architect, Owner's Representative, local code authority and Factory Mutual Representative. The following are minimum requirements; comply with requirements of local and State codes and ordinances.
 - 1. Test all piping hydrostatically at 200 psig for two hours. Note particularly NFPA requirements for: Piping pitch, drainage, flushing connection provisions, testing, discharge of drain valves to the nearest plumbing drain, etc.
 - 2. All underground supply connections must be thoroughly flushed before connecting to the sprinkler system risers.
 - 3. Supply piping to sprinkler system shall be flushed at a rate of flow not less than 750 gpm for 6" pipe, 1000 gpm for 8" pipe, 1500 gpm for 10" pipe and 2000 gpm for 12" pipe. The minimum rate of flow for flushing supply piping to open sprinkler deluge or hydraulically designed system should equal or exceed the demand rate as determined by the system design.
 - 4. System and the fire department connection shall be hydrostatically tested to 200 psi for two hours or 50 psi in excess of the maximum pressure on the system when that pressure exceeds 150 psi.
 - 5. Provide completed underground flushing certificate and standard test certificate in accordance with NFPA 13.

3.02 FREEZE PROTECTION

- A. The Contractor shall be responsible for freeze protection as follows:
 - 1. A dry pipe system(s) shall be provided in attics and other unheated areas where necessary so as to prevent freezing.
 - 2. Dry sprinkler systems shall be complete with tank mounted compressor, controls, valves and all necessary appurtenances. Termination of drains shall be approved by the Architect.
 - 3. Wet pipes shall not be routed through unheated spaces.
 - 4. The Contractor shall be responsible for repairing and/or all costs incurred from damage caused by freezing of the fire protection services.

3.03 CLEANING

- A. At the completion of this work, remove from the site all excess materials and debris. Leave entire work in a neat and workmanlike condition ready for the Architect's inspection.

3.04 PROTECTION

- A. Protect all work of this Section until date of Substantial Completion. Repair or replace damaged work at no additional cost to the Owner.

END OF SECTION