SECTION 15710
FIRE SPRINKLERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

General Provisions of Contract, including General and Supplementary conditions and General Requirements (if any) apply to work specified in this Section.

1.02 DEFINITIONS

A. Reviewed equal: Shall mean that the Engineer, not the contractor, shall make final determination whether materials are an equal to that which is specified.

B. Equal: Shall mean essentially the same as that product specified, but a model of a different manufacturer.

C. Concealed: Shall mean in walls, in chases, above ceilings, within enclosed cabinets, otherwise enclosed.

D. Exposed: Shall mean in finished spaces, in closets, under counters, behind and/or under equipment and/or otherwise visible.

E. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

F. Others: Shall mean provided by sections other than this section. If not purposely assumed by another section, shall be provided by the Contractor.

G. Materials: Shall mean any product used in the construction, including but not limited to: fixtures, equipment, piping and supplies.

H. Piping: Shall mean pipe, fittings, hangers and valves.

I. Provide: Shall mean the furnishing and installing of materials.

J. Substitution: Shall mean materials of significantly different physical, structural or electrical requirements, performance, dimensions, function, maintenance, quality or cost, than that specified.

1.03 ALTERNATES

There are NO alternates that apply to this section of the project.

1.04 DESCRIPTION OF WORK

A. Work Included

A. Provide all design services, construction documents, labor, transportation, equipment, permits, materials, tools, inspections, incidentals, tests and perform all operations in connection with the installation of a complete new Hydraulically Designed Wet Pipe Sprinkler System in all heated areas of the buildings, with a dry system in the Parking Garage and in misc. unheated spaces and overhangs. Provide a Fire Pump to boost the system pressure as required. Comply with requirements of all Authorities Having Jurisdiction. Include aesthetic considerations into the design. Coordinate with interfacing trades. Submit equipment and components for review. Prepare Shop and Record Drawings and Owner's Manuals. Assure quality of workmanship. Provide guarantees and warranties.

1. Automatic Sprinkler System shall meet the standards of the most recent edition of the National Fire Protection Association's (NFPA) NFPA 13R Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height.

2. Dry Automatic Sprinkler System and wet system in Retail Areas shall meet the standards of the most recent edition of the National Fire Protection Association's (NFPA) NFPA 13 Standard for the Installation of Sprinkler Systems.

3. A Manual Wet Class 1 Standpipe system shall be provided in the stairwells of the building and shall meet the requirements of the National Fire Protection Association's (NFPA) NFPA 14 Standard for the Installation of Standpipe, Private Hydrant and Hose Systems.

5. An Electric Fire Pump shall be provided and shall meet the requirements of the National Fire Protection Association's (NFPA) NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection

1.05 SUBMITTALS

A. Shop Drawings:

1. Within 30 working days after the Contractor has received a fully executed contract, prepare and submit Plans / Shop Drawings in accordance with the requirements of NFPA and obtain the Engineer's approval and Owner's Insurance Underwriter approval before proceeding with the fabrication and work.

2. Drawings shall include, but not be limited to:
   a. Name of Owner and Occupant
   b. Name and address of Contractor.
   c. Physical Location
   d. Plan view of system
   e. Full height cross section or schematic diagram including ceiling construction and spray obstructions.

f. Locations of all partitions, with fire partitions noted.
g. Occupancy class for each area and minimum density of water application.
h. Locations of concealed spaces
i. Plan showing location and size of city water main, where private main attaches, all valves, distance and elevation between main and riser.
j. Recent hydrant test showing both static and residual pressures, and date and time taken. List any significant known daily or seasonal pressure fluctuations and the cause.
k. Make, model and nominal K factor of sprinkler heads.
l. Control valves, check valves, drain pipes and test connections.
m. Fire department connections
n. Details showing riser piping configurations.
o. Pipe sizes.
p. Switches and supervisory devices.
q. Interface with Fire Control Panel.

3. To obtain an electronic copy of the building plan and sections, contact the Engineer. Specify required CAD format when requesting the files.

4. Procedure

a. As soon as possible after award of Contract, before any material or equipment is purchased, this Contractor shall submit to the Engineer no less than six (6) copies for approval. Shop drawings shall be properly identified and shall describe in detail the material and equipment shall be provided, including all dimensional data, performance data, curves, computer selection print-outs, etc.

b. Corrections or comments made on the submittals do not relieve the contractor from compliance with requirements of the specification. Shop drawing review is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

c. All related items shall be submitted as a package.

4. Submit data on the following items:
a. Piping, fittings and couplings.
b. Alarm check valves and trim.
c. Backflow preventer.
d. Valves and supervisory devices.
e. Sprinkler heads and escutcheon plates.
f. Supports, hangers and accessories.
g. Fire Department Connections.
h. Any other significant item valued over $100.00

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

1.06 HYDRAULIC DESIGN DATA

A. Building Occupancy: Apartments and Parking

B. Water Density and Square Foot Requirements: Provide per NFPA.

C. Codes and Requirements:

1. Comply with the standards of most recent edition of the National Fire Protection Association.

2. Comply with the BOCA International Building Code, all Maine State laws as well as local codes and ordinances.

3. Comply with the requirements of the State Fire Marshals Office, Local Fire Chief, Owners Insurance Underwriter, Local Water District and other Authorities Having Jurisdiction

1.07 GUARANTEE

This Contractor shall guarantee all materials and workmanship furnished by him or his sub-contractors to be free from all defects for a period of no less than one (1) year from date of final acceptance of completed system and shall make good, repair or replace any defective work which may develop within that time at his own expense and without expense to the Owner.

1.08 MAINTENANCE MANUAL

On completion of this portion of the work, and as a condition of its acceptance, submit for review two copies of a manual describing the system. Prepare manuals in durable 3-ring binders approximately 8.1/2" by 11" in size with at least the following:

A. Project name on the spine and front cover, and identification on the front cover stating the project name, general nature of the manual, and name, address and telephone number of the General and Sprinkler Contractors.

B. Neatly typewritten index.

C. Complete instructions regarding operation and maintenance of all equipment involved.

D. Complete nomenclature of all frequently replaceable parts and supplies, their part numbers, and name, address and telephone number of the vendor.

E. Copy of all guarantees and warranties issued, and dates of expiration.

F. Shop drawings and equipment/fixtures manufacturer's catalog pages.

PART 2 – PRODUCTS

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

2.01 MANUFACTURERS

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

B. Heads: Viking, or equal.

C. Flow Switch and Supervisory Device: Potter Electric Signal Company or equal.

D. Backflow preventer: Ames or equal.

2.02 MATERIALS

A. Piping:

1. Outside Building, Underground: Connect where the site piping ends. Match materials and methods until inside the building.

2. Inside building: Shall be schedule 40 black steel, standard weight welded, threaded or Victaulic fittings for sizes 2-1/2" and under. Install flanged fitting and flanges at valves and where required. Threadable light wall pipe (schedule 10) shall be permitted only for sizes 3" and over.

3. Where permitted by code, and based on the construction, the contractor may substitute CPVC sprinkler system piping in lieu of the above for the wet sprinkler system. Install according to manufacturer's requirements and restrictions. Piping and fittings shall be Harvel Blazemaster CPVC fire sprinkler piping. Piping shall be installed only by a factory trained and certified installer. Do not use where piping is exposed or where manufacturer's requirements cannot be met.

B. Sprinkler Heads:

1. Temperature Classification:
   a. Finished area shall be ordinary temperature rating.
   b. Boiler /mechanical room shall be Intermediate temperature rating 175° F to 225° .

2. All shall be Quick Response bulb type head.

3. Type:
   a. Generally shall be white, concealed pendant.
   b. Concealed spaces shall be the type best suited for the configuration of the individual space.
   c. Any minor unheated spaces shall be dry type.

4. Provide and install a spare head case per NFPA 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: Provide per NFPA. Provide seismic protection unless specifically exempt by the Authority Having Jurisdiction. Hang from building structure, not piping of other trades.

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.

5. Fire caulk all penetrations through floors and fire rated partitions.

E. Valves:

1. Riser Control Valve: OS&Y cast iron construction.

2. Sectionalizing Valves: OS&Y cast iron body.

3. Drain and Test Valves: Bronze body, gate type or ball type, capable of being padlocked in either open or closed position.

F. Provide all miscellaneous items required for a complete system, such as: paint, signs, valve tags, pipe markers, chains and locks, relief valves, and water additives.

2.03 COMPONENTS

A. Fire Department Connection (Verify with local Fire Department). 4" Fire Department connection with, caps with chains and wall plate with "Auto Sprinkler". Thread Pattern shall match that of the local Fire Department equipment; also 4" UL listed check valve with automatic ball drip piped to drain. Bronze finish.

B. Flow Switch for Wet Systems: Model # VSR-F vane type water flow alarm switch with an adjustable retard setting from 10 seconds to 90 seconds having two sets of DPDT contacts for reporting to the building fire alarm system.

C. Electric Supervisory Switch: All valves shall have a Model # OSYSU-2 electric supervisory device with 2 sets of DPDT contacts to report to the building fire alarm system.

D. Backflow preventer: Double check, testable, replaceable seats.

E. Provide all shut-off valves with tamper switches. Lock or chain open valves with break-away padlocks.

F. Water pressure gauge: Provide one before the valve on each inspectors test connection. Range applicable to fire protection application.

2.05 FIRE PUMP AND COMPONENTS

Provide a complete fire pump system will all valves, gauges, bypass loop, hose valve, controls etc., required for a complete system. Must fit inside pump room.

A. Fire Pump: Electric Fire Pump and shall be U.L. listed and/or F.M. approved.

B. Driver: The fire pump will be driven by an electric motor that is specifically listed by Underwriters Laboratories and approved by Factory Mutual for fire pump service. Coordinate electrical with electrical contractor before ordering.

C. Built in Controller, U.L. and F.M. approved, full voltage across the line starter limited service pump controller, automatic transfer switch.

PART 3 – EXECUTION

3.01 PREBID EXAMINATION AND INVESTIGATION

A. Visit the site and become acquainted with the conditions.

B. Study all Drawings and Specifications for all related and interfacing trades. No claim will be recognized for extra compensation due to failure to become familiarized with the conditions and extent of the proposed work as indicated within.

C. Ascertain all Authorities Having Jurisdiction, and consult where needed.

3.02 OBTAINING DRAWINGS AND SPECIFICATIONS

A. Obtain a FULL set of drawings and specifications as soon as is practical.

3.03 SPECIFIC INSTALLATION REQUIREMENTS

A. All SPRINKLER piping in finished areas shall be run concealed.

B. For aesthetic reasons, locate sprinkler heads neatly and symmetrically, relative to the walls, ceiling grid, diffusers and light fixtures. Center heads in tiles in suspended ceilings.

C. All piping shall be run as high as practicable. Pitch piping slightly to allow the system to be drained.

D. System drains shall be valved and piped to discharge. No valve shall be provided ahead of the electric alarm devices.

E. All sprinkler work shall avoid proposed locations of, and installation clearances for, lighting, ducts, piping, framing and equipment.

F. Paint all exposed sprinkler and standpipe piping, color as determined by Architect.

3.04 COORDINATION

A. Coordinate work with that of other trades. Coordinate early for locations of mains. Ductwork, mechanical equipment, electrical panels and large gravity piping will be given priority over sprinkler piping, unless all effected parties agree otherwise. 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.

B. Contact Electrical Contractor and assure that all requirements for power and fire alarm system have been met.

3.05 TESTS

A. The entire installation shall be tested with water in accordance with all NFPA requirements, all requirements of the local Fire Department and local Water District; 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 Chief's representative. Submit copies of all test certificates, properly signed, to the Engineer.

END OF SECTION