

Part II
Division 21
Fire Supression

SECTION 21 00 00

FIRE PROTECTION

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and the "Conditions of Contract" including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this Section.
- B. Examine all drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section whether or not such work is specifically mentioned in this Section.

1.2 DESCRIPTION OF WORK

- A. This is a design build project. The contractor shall hire Registered Professional engineer (Maine State registration required) to prepare drawings and calculations for the owner's approval. Engineer will provide \$1,000,000.00 liability insurance. The engineer shall provide during the construction two site visits and submit report verifying that the sprinkler system has been installed in compliance with the design. The engineer will also provide a final punch list and report. The engineer shall also provide all the site visits required by the inspection agencies and building department.
The work covered in this section of the specifications consists of furnishing all labor, equipment, appliances and material and in performing all operations in connection with this Fire Protection System, complete, in strict accordance with this Section of the specifications.
- B. The sprinkler system shall be designed and hydraulically calculated per NFPA 13 and NFPA 14.
- C. General Requirements:
 - 1. The intention is to provide complete sprinkler system as required by NFPA 13 and NFPA 14 including the design drawings and calculations.
 - 2. If any contradiction, ambiguity, error, inconsistency, omission or incomplete system appears in or between any contract documents, the contractor shall before submitting the final bid and signing the contract for construction, notify the architect and request a written resolution as to which methods or materials will be required. If the contractor fails to make a request for interpretation or resolution, no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the architect. This generally means the use of the highest quality material, most expensive way of performing the work and providing complete functioning system for proper operation.

3. Each and every trade or subcontractor will be deemed to have familiarized themselves with all the contract documents of this projects, including architectural, structural, mechanical, electrical, and site work, and to have visited the site, so as to avoid error, omissions and misinterpretations. Related information may be provided on contract documents other than those associated with the subcontractor's trade. The contractor is responsible for coordinating related work of all the contract documents. No additional compensation will be authorized for alleged errors, omissions or misinterpretations whether they are a result of failure to observe this requirement or not.
4. All penetrations of assemblies exposed to the exterior environment shall be sealed with foam sealant or equivalent sealer to provide zero air infiltration. Coordinate with fire stopping requirements.
5. No component of any system shall run through the stair enclosure that does not relate to or serve the stair enclosure. Sprinkler piping excluded.
6. Refer to architectural drawings for type and location of all fire rated walls. Any penetration through wall bottom or top plates shall be Fire Stopped. Any penetration the fire rated wall shall be Fire Caulked. Refer to section 7250 for procedure. Provide submittals of UL designs selected and the product information for approval.
Without limitation pay attention to the following items:
 - a. Chases behind bathroom (wall between corridor and bathroom) and walls between units are fire rated. Fire Caulk all penetration.
 - b. Top and bottom wall plates at ceiling and at floor are part of fire separation. Fire Stop all penetrations through plates.
7. Any wall location changes shall be coordinated through the G.C for review with the architect.
8. Sprinkler Contractor to coordinate with the General Contractor the flushing requirements for the fire mains.
9. Provide the following systems complete with all accessories:
10. New backflow preventer and shut of valves
11. Wet alarm valves.
12. Fire department connection.
13. Shut-off valves with tamper switches.
14. Standpipes and zone valves.
15. Modify existing sprinklers to comply with NFPA 13 for the entire building. Visit site and review existing conditions and compare with architectural demolition and reconstruction plans to identify the scope of the work. Review zone valve locations and sprinkler head types and age. Coordinate with fire department for their requirements and include all requirements in the contract price. There is a stair without standpipe. Provide standpipe for this stair if required by the fire department.
16. Provide sprinkler coverage for all concealed spaces containing combustible material.
17. Sprinkler layout drawings stamped by registered professional engineer.
18. Perform hydraulic calculations, flow test.
Seismic Constraints.
19. Spare sprinkler cabinet with 6 sprinklers of each type and necessary wrench.
20. Painting of all exposed piping as directed by architect.

21. Dry sprinkler heads in all loading docks.
22. At the end of project a set of as build drawings shall be provided. All drawings shall be prepared on ACAD 2004 or higher version.

There should be no exposed piping in finished areas. All exposed piping will be painted. Coordinate with G.C for the scope.

- D. Before buying or installing any equipment, complete working plans shall be submitted and approved by the insuring agency. The word "approved", as used in these specifications, means acceptable to the insuring agency and local Fire Department.
- E. After approval of working plans has been received, submit copies in accordance with Section 01600 to the Architect for comments.

1.3 RELATED WORK

- A. The following items are to be done under other Sections:
 1. Electrical wiring.
 2. Cutting and patching.
 3. Water service.

1.4 REGULATIONS, FEES AND PERMITS

- A. All materials and installation shall conform to the requirements of the State of Maine Building Code, local codes and applicable sections of NFPA.
- B. The subcontractor shall give the proper authorities all required notices, pay all fees, and obtain official licenses, and permits. He shall prepare detailed drawings and have them approved by the local Fire Department.

1.5 DRAWINGS

- A. This is a design build project. The contractor shall hire Registered Professional engineer (Maine State registration required) to prepare drawings and calculations in compliance with NFPA 13 and NFPA 14 for the owner's approval.
- B. The sprinkler system shall be designed and hydraulically calculated per NFPA 13 & NFPA 14.
- C. Drawings shall be coordinated through the General Contractor with all other trades including structure prior to completion.
- D. Should any contradiction, ambiguity, error, inconsistency, omission or incomplete system appear in or between any of the Contract Documents, the Contractor

shall, before submitting the final bid and signing the contract for construction, notify the General contractor and request a written resolution as to which methods or materials will be required. In the event of conflicting requirements of standards, drawings or specifications, the Contractor shall comply with the more stringent requirements. Before submitting the final bid and signing the contract for construction the Contractor shall obtain a written interpretation from the Architect. In no case shall the Contractor proceed with the affected work until advised by the Architect.

If the Contractor fails to make a request for interpretation or resolution no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the Architect. This generally means the use of the highest quality material, most expensive way of performing work and providing complete functioning systems for proper operation,

Each and every trade or Subcontractor will be deemed to have familiarized themselves with all Contract Documents of this project, including Architectural, Structural, Mechanical, Electrical and Site Work, and to have visited the site, so as to avoid errors, omissions and misinterpretations. Related information may be provided on Contract Documents other than those associated with the Subcontractor's trade. The Contractor is responsible for coordinating related work of all the Contract Documents. No additional compensation will be authorized for alleged errors, omissions and misinterpretations, whether they are a result of failure to observe this requirement or not.

1.6 INSPECTION OF SITE

- A. This Contractor shall prior to submitting his bid, visit the site and inspect conditions affecting the proposed work. Failure to visit the site and misinterpretation of the drawings and specifications resulting therefrom shall be entirely the responsibility of the bidder. No claims based on lack of knowledge or difficulties resulting from same shall be allowed.

1.7 GUARANTEE

- A. All equipment, labor, and materials furnished under this section of the specifications shall be guaranteed for a period of one year from the date of beneficial occupancy thereof against defective materials, design and workmanship. Materials and/or equipment found defective shall be replaced with new materials and/or equipment at this Subcontractor's expense. This Subcontractor shall guarantee that all elements of the system are of sufficient capacity to meet the requirements set forth herein. Upon receipt of notice from the Owner or Architect of any failure during the guarantee, the defect shall be remedied promptly by and at the expense of this Subcontractor.
- B. This Subcontractor shall see that there is no conflict in the work and no conflict with the work of other trades. Any conflict shall be immediately brought to the attention of the Architect.
- C. In general, the plumbing piping and ventilation systems shall be given the right of way. All piping shall be installed to conform with finished work as shown on the

Architectural drawings, and shall be installed to clear all electrical equipment indicated.

1.8 SUBMITTAL

- A. Submit appropriate drawings and descriptive literature giving performance data, physical size, material, etc. for all items under this Section, including the following:

Fire department connection.

OS&Y valves.

Waterflow alarm switches.

Sprinkler heads.

Piping and sprinkler heads layout drawings with hydraulic calculations.

Fire stopping methods.

1.9 AS BUILT DRAWINGS

- A. At completion of the job, a set of blue lines shall be provided correct and complete, showing locations of piping, valve, drains and sprinkler heads.

1.10 CERTIFICATES OF APPROVAL

- A. Certificates of approval of the completed installation by the insuring agency and the local fire department shall be furnished to the Architect.

2 PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

- A. All piping for the sprinkler system 2 inches and smaller in size, shall be Schedule 40 black steel pipe with threaded ends conforming to ASTM Standard A120. Latest Amendment, approved for use in Fire Protection Systems. All piping inside the building, 2 1/2" and larger in size, unless otherwise noted, shall be Schedule 10 black steel pipe with rolled groove ends, approved for use in Fire Protection Systems. CPVC pipe (Blaze master) can be used at the contractors option where allowed by code.
- B. Fitting for the sprinkler systems may be either cast iron or malleable iron. Cast iron fittings shall be extra heavy pattern for pipe sized larger then two inches (2"). Malleable iron fittings of standard weight pattern will be acceptable in sizes up to six inches (6"). U.L. approved and F.M. listed groove fittings will be allowed. All fittings shall be approved by Underwriter Laboratories for use in sprinkler system and shall be designed and guaranteed for a working pressure of not less then

174 psi cold water pressure.

- C. All close and shoulder nipples shall be of corresponding materials as the pipe and shall be extra heavy pattern. All pipe shall be run true to line and grade and, in general, parallel to walls and ceilings. All open ends of the pipe lines, equipment, etc., shall be properly capped and plugged during the installation in order to keep dirt of foreign materials out of the system. All work shall be performed in a practical manner and according to the highest standards of workmanship.
- D. All threaded pipes shall have full tapered threads with ends reamed out after threading and cutting.
- E. The interior of all pipes and fittings shall be cleaned before assembling. All pipe threads (not fitting) shall have a thorough application of approved pipe joint cement before assembling. Any leaky joints shall be remade, as caulking will not be permitted. All pipe shall be pitched as required. Means shall be provided to completely drain the system.

2.2 SPRINKLER HEADS

- A. Sprinkler heads shall be wet Type and the latest designs by Grinnell, Reliable, Automatic Sprinkler Co., Central Sprinklers Co. or approved equal.

2.3 VALVES

- A. Except for miscellaneous small valves, all valves shall be plainly marked with the name or trade-mark of the manufacturer, the year of the manufacture, and the Factory Mutual identification mark. All gate valves controlling water flow shall be OS&Y with tamper switch suitable for 150 lb. working pressure. Valves 2" and smaller shall have bronze bodies and bonnets with screwed ends. Valves 2-1/2" and larger shall be flagged. All gate and seat rings shall be machined bronze. Stems shall be bronze and of a design so that the stuffing box may be repacked under pressure when the valve is wide open. All hand wheels shall be marked with an arrow and the word "OPEN". Listed butterfly valves can be used.

2.4 FIRE DEPARTMENT CONNECTION

- A. 4" Stortz type or as required by the local fire department.

2.5 WET ALARM VALVE

- A. Wet alarm valve shall be constant pressure type, positive-locking clapper, fast-acting, two piece construction permitting quick, easy maintenance and replacement of internal valve parts. All working parts shall be bronze or brass. Provide with retard chamber, electric alarm gong, pressure switch.
- B. Make: Viking, Star, Reliable.

2.6 PENETRATION AND FIRESTOPPING

- A. All metal pipe penetrating through a fire-rated wall assembly shall have the space between the conduit and the fire rated membrane (drywall) filled with a UL approved fire caulk installation.
- B. All metal pipe penetrating through fire-rated floor assembly shall have the space between the pipe and the fire rated membrane (drywall, concrete or plywood decking) filled with a UL approved fire caulk installation.
- C. Install a UL approved fire caulk installation where any pipe penetrates a fire stop (top and bottom wall framing plates) inside the walls.
- D. Large openings in slabs, which accommodate many pipes, shall be filled with concrete so that the rodent protection of the slab is maintained.
- E. All penetrations of assemblies exposed to the exterior environment shall be sealed with foam sealant or equivalent sealer to provide zero air filtration through or around penetration. Coordinate with fire stopping requirements.
- F. Large openings in slabs, which accommodate many pipes, shall be filled with concrete so that the rodent protection of the slab is maintained.
- G. All penetrations of assemblies exposed to the exterior environment shall be sealed with foam sealant or equivalent sealer to provide zero air filtration through or around penetration. Coordinate with fire stopping requirements

3 PART 3 EXECUTION

3.1 INSTALLATION

- A. All pipe shall be new, of weights specified and scale free. Pipe lines shall be made up with as few joints as possible. Threads shall be clean cut of full length. The ends of all pipe shall be reamed after cutting and all burrs and fins removed. The inside of all pipes shall be thoroughly cleaned and straightened before erection. All welding shall conform strictly to the code of the American Welding Society and shall be tested as prescribed by the Code. In general, pipe shall pitch so as to afford complete drainage of all parts of the system.
- B. Joints: All screwed joints shall be made up with suitable compound applied to the pipe in all cases and never to the fittings. If it becomes necessary to back off a fitting after it has once been made up with compound, the threads shall be cleaned and new compound applied before remaking the joint. All flagged joints shall be made up with appropriate screwed cast iron companion flanges and drilled to American Standard, machine steel with square heads and cold pressed hexagonal nuts. Gaskets shall be 1/16" red rubber, ring type with outside diameter tangent to the bolts.

- C. Drain connections: Provisions shall be made to drain all low points or pockets occurring in the systems. Drain valves shall be hose end gate valves, straight or angle pattern.
- D. Test connection: A test gauge connection shall be provided at the highest or at the most remote point in the system whichever is calculated to show the least pressure under normal flow conditions.
- E. Valve signs: All control valves shall be marked with properly designated signs.
- F. The installation shall be coordinated with other trades to allow space allocations and avoid conflicts during construction.

3.2 TESTS

- A. When work is completed, each system shall be subjected to a test pressure of 100 psi water pressure at topmost outlet and held for two hours. 200 psi at the Fire Department connections, and held for two hours. After completion of tests and approval by the Architect, this Subcontractor shall furnish the Architect a certificate as required by Pamphlet Nos. 13, 14 and 20 of the National Fire Protection Association.

...END OF THIS SECTION