

SECTION 21 10 00

AUTOMATIC SPRINKLER SYSTEM

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PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. Work specified in this Section includes, but is not limited to:
 - 1. Rework existing wet fire protection sprinkler system to provide complete automatic wet sprinkler system coverage in lab areas within contract limits shown on the contract drawings in accordance with NFPA 13.
 - 2. Coordinate with other trades to accommodate removal/replacement of existing walls and ceilings. Existing sprinkler piping arrangement and sprinkler head locations may remain if code compliant and not in conflict with the new work of other trades.
 - 3. All existing fire protection system piping and sprinklers shall remain in place and in-service during the demolition of the work of other trades - ceilings, light fixtures, HVAC equipment, etc.
 - 4. Where existing fire protection piping obstructs the demolition/removal of the work of other trades, contractor shall temporarily remove/relocate piping as needed to facilitate the demolition.
 - 5. Fire protection piping shall be returned to service as soon as demolition work is completed in areas that require fire protection piping removal/relocation. All fire protection piping shall be returned to service at the end of the work day and shall not be shut off after hours.
 - 6. Contractor shall use extreme care to avoid mechanical injury to existing sprinklers that could cause a false discharge condition.
 - 7. Provide sprinkler heads in all areas to insure required coverage per NFPA 13. Where sprinkler coverage outside of contract limits is affected by addition, relocation or removal of walls within contract limits, sprinklers shall be added, removed or relocated as needed for NFPA 13 compliance.
 - 8. Piping layouts as required to meet NFPA 13 Standards.
 - 9. Testing of system.
- B. The work of this section is subject to the requirements of the Mechanical General Section.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS:

- A. Coordinating
- B. Basic Materials and Methods
- C. Supports and Anchors

1.3 QUALITY ASSURANCE:

- A. Total installation shall be made in accordance with the requirements of the Office of the State Fire Marshal, The State Department of Public Health, local authorities having jurisdiction and the owner's insurance underwriter where applicable.

- B. The contractor shall prepare installation shop drawings and hydraulic calculations and submit for review. The contractor is responsible for the accuracy and completeness of shop drawings and hydraulic calculations.
- C. Where guidelines of other authorities having jurisdiction differ from those given here, contractor shall use the most stringent in each case.
- D. Base hydraulic calculations on the available water supply and in accordance with NFPA 13.
- E. Occupancy/hazard sprinkler system design criteria:
 - 1. All office, meeting and customary access areas: NFPA 13, Light hazard, using quick response sprinklers.
 - 2. Laboratories, Mechanical Equipment Rooms, Transformer Rooms, Electrical Switchgear Rooms and Electric Closets: NFPA 13, Ordinary hazard, Group 1.
 - 3. Housekeeping supply, trash rooms, utility rooms and storage rooms: NFPA 13, Ordinary hazard, Group 2.
 - 4. File Storage Areas with "Space Saver" shelving less than 18" beneath sprinkler deflectors: Provide 0.20 gpm per square foot for the entire area of the space up to 1500 square foot area of sprinkler operation. Arrange sprinklers to provide coverage over aiseways wherever it is possible for aiseways to exist. Provide 6" deep x 9" wide 18 ga. metal baffles between sprinklers less than 6' 0" apart.

1.4 SUBMITTALS:

- A. Submit shop drawings indicating all phases of the installation including materials, pipe, valves, sprinkler heads, control devices, sections, elevations, details of special hangers and riser details for review and approval. Submittal shall be made to the Architect at the same time it is made to other authorities having jurisdiction.
- B. Submittal shall include return bend fittings and piping in hydraulic calculations.
- C. Contractor shall include license, permit or certification number on the shop drawings.
- D. Submittal shall include a hydrant flow test performed or witnessed by the contractor at a hydrant as close to the project site as possible. Hydraulic calculations shall be based on such test and include fire booster pumps in the calculations where applicable.
- E. Shop drawings shall include a schematic diagram showing routing of underground piping from the base of the existing sprinkler riser to the water flow test point including distances and hydraulic reference nodes.
- F. Submit six (6) sets of shop drawings, to the Architect for approval. The submittal shall include evidence that the shop drawings have been sent to other review authorities. Approvals from other authorities shall be provided to the Architect.

Revisions shall be made for comments and resubmitted for approval. No work is to begin until approvals have been given in writing.

- G. Submitted drawings shall include all information required for working plans listed in NFPA 13 including full height cross section showing structural/ceiling construction, location of water supply, flow test, zone control details, riser details, auxiliary test/drain locations, hanger details and routing of underground piping to water supply where applicable.

1.5 COORDINATING:

- A. Coordinate design and installation with other trades for timely installation and to avoid delays and interference.
- B. Contractor shall make offsets in piping to accommodate the work of other trades without additional cost to the owner.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. All devices and equipment shall be UL listed and FM approved for fire service.

2.2 SPRINKLERS:

- A. Sprinkler heads shall be commercial type, U.L. listed by Victaulic, Tyco, Viking, Reliable, Globe or approved equal.
- B. All existing sprinklers throughout the lab building within contract limits shall be replaced with new sprinklers, provide quick response concealed sprinklers in office areas and clean room type "sealing concealed" sprinklers throughout lab areas. Provide brass upright sprinklers on exposed piping in areas without ceilings. Do not mix standard response and quick response sprinklers within the same compartment
- C. Do not provide sprinklers using o-ring technology in their manufacture.

2.3 INSIDE PIPING, FITTINGS AND HANGERS:

- A. Piping shall be schedule 40 black steel according to ASTM A53, Grade B with 125 psi cast iron fittings according to ASTM A126 or welded according to ASTM A-234 capable of withstanding a working pressure of 175 psi. Hangers shall be furnished and installed in full accordance with the requirements of NFPA 13 and be UL 203 listed. Piping may be light wall in accordance with ASTM-A135 with roll groove fittings, if approved by the authority having jurisdiction. All grooved fittings, couplings and grooving tools shall be supplied by one manufacturer.
- B. Existing pipe, fittings and hangers may be re-used if code compliant but all sprinklers within contract limits shall be new.

PART 3 - EXECUTION

3.1 INSTALLING:

- A. Install inside piping according to NFPA and accepted construction practices. Support piping from structural members and bar joist using approved type hangers. Install piping to give maximum headroom in the areas of exposed piping and provide low points with adequate drains in accordance with NFPA 13 standards.
- B. All upright heads shall connect to the branch line with a reducer and one inch tee.
- C. All wet system pendent sprinklers shall be provided with a return bend connection to the branch line
- D. Sprinkler heads shall be centered in ceiling tiles.
- E. Furnish sprinkler cabinet with required number of assorted heads plus one sprinkler wrench to owner.
- F. Provide test and drain assemblies as required by NFPA 13. Inspector's test connections, auxiliary drains and main drains shall be arranged to discharge outside the building above grade. Provide concrete splash block for discharge. Exterior pipe and fittings shall be galvanized. Where portions of drain piping must be routed below grade or otherwise have low points below the level of discharge to outside, provide a ½" tee outlet with ball drip at the low point. Install ½" piping from the ball drip to a suitable nearby sink or floor drain.
- G. Provide identification signs for alarm valve, test and drain valves, etc. as required by NFPA 13.

3.2 FIELD TEST AND REQUIREMENTS:

- A. Final installation shall be tested and witnessed by the Owner's representative before being placed in service.
- B. Installation shall not be deemed as complete until certificates of acceptance from the authorities having jurisdiction are presented to and accepted by Owner.

3.3 ADJUST AND CLEAN UP:

- A. Make necessary adjustments of completed installation as required for proper functioning of system.
- B. In each area as installation is completed, promptly remove debris, excess materials and foreign matter. Area floors, surfaces, sprinkler system equipment and equipment of other trades piping shall be left clean.

3.4 WATER SUPPLY:

- A. The sprinkler contractor is not responsible for the adequacy of the water supply, however, the Contractor shall perform or witness a flow test at the site prior to submittal of shop drawings and furnish test data at time of submittal for approval.

3.5 ACCESS PANELS:

- A. Provide access panels for valves, switches and other items requiring maintenance in enclosed spaces. Panels shall be fire rated type. See Section "Basic Mechanical Material and Methods" for specification.

3.6 CERTIFICATION:

- A. Fire protection systems shall be installed only by contractors licensed by the state for fire protection work.

END OF SECTION 21 10 00