

SECTION 21 13 13
WET PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION

- A. Furnish all materials and labor for the proposed relocation of existing sprinkler heads as indicated on the fire sprinkler plans, here after referred to as the "System(s)".
- B. The contract drawings and this Specification define the scope of work for the project. The contract drawings are intended to be schematic only, and the Contractor's responsibilities are defined herein. Where conflicts occur between the Specification and contract drawings, the bidder is instructed to request clarification prior to bidding. In general, should a conflict occur, the Specification will overrule the contract drawings.
- C. The work shall be subject to the terms and conditions contained in the "Construction Contract," agreement between the Contractor and the Owner.

All applicable fees, taxes, and permit costs for all work contained in this specification section shall be included in this Contractor's base bid.
- D. Contractor shall be responsible for the review and compliance with this Specification section. All work shall be performed in accordance with these Specifications and good engineering and installation practice. Modifications to these Specifications will NOT be accepted without the expressed written approval of Owner, Owner's Representative, and/or Owner's Insurance Carrier; herein referred to as the "Owner". It is Contractor's responsibility to document the required approvals of any such modifications prior to the execution of work.
- E. Contractor shall field verify all site conditions and information contained on the contract drawings and is responsible for the complete design and installation of the system(s) in accordance with the specifications. The contract drawings may not show all information necessary for installation of the system(s), but are intended to be used by Contractor for the purpose of preparing a bid. The contract drawings indicate the following:
 - 1. Approximate pipe routing and sizes.
 - 2. Types and minimum quantities of sprinklers.
- F. There shall be no impairments to any of the adjoining building system(s) in any way due to the work provided for in this specification.

1.02 INTENT OF SPECIFICATIONS

- A. The work performed pursuant to these specifications is to be complete in every respect, resulting in the System(s) installed in accordance with the applicable codes, standards, manufacturers' recommendations, and Underwriters Laboratories Inc. (UL) listings and/or Factory Mutual (FM) Global approval.
- B. Upon completion of this work, and as a part of this contract, Contractor shall provide Owner with:
 - 1. Complete information and "as-built" record drawings describing and depicting the entire system as installed, including all information necessary for maintaining, troubleshooting, and/or expanding the system at a future date.
 - 2. Complete documentation of system(s) testing and Authority Having Jurisdiction (AHJ) acceptance.
 - 3. Certification that Contractor's work has been inspected and tested, is installed entirely in accordance with the applicable codes, standards, manufacturers' recommendations and UL listings and/or FM approvals, and is in proper working order. Contractor shall use "Contractor's Material and Test Certificate(s)" as required by NFPA codes.

1.03 WORK INCLUDED

- A. General: Furnish all materials and labor for the design, installation, and testing of sprinkler relocations in accordance with all applicable codes and requirements of this Specification
- B. Sprinkler: Furnish and install all components necessary for the automatic sprinkler system(s) to result in (a) fully operational system(s).
- C. Demolition: Perform demolition as indicated on the plans. Contractor shall not re-use any removed material for the new sprinkler (and standpipe) system(s) in this Specification.
- D. Submittals: Prepare and submit shop drawings, product data sheets, record drawings and other submittals required herein. Work is not to proceed until all required submittals have been approved by Owner and all AHJ. Contractor shall be responsible for the submission of the required materials to the owner and all approving authorities.
- E. Tests: Each sprinkler system shall be tested in accordance with the requirements of NFPA 13, AHJ and the Owner. Contractor shall be responsible for carrying out all required tests. Separate tests may be required by the Owner and AHJ.

- F. Warranty: Warranty all new equipment and systems modified during installation and for a period of one (1) year after final acceptance of the work by the Owner.
- G. Approvals: Obtain all approvals required for the work of this section from all AHJ and Owner.
- H. Fees: Pay all fees required to obtain permits, inspections and final approval of the work in this section.
- I. Coordination: Coordinate work with all other trades working on the project.

1.04 QUALITY ASSURANCE

- A. All work shall conform to the requirements of the applicable editions and portions of the National Fire Protection Association (NFPA) Standards, locally adopted codes, and
 - 1. NFPA 13 "Standard for the Installation of Sprinkler Systems"
 - 2. NFPA 72 "National Fire Alarm Code"
 - 3. Veterans Administration Design Standards (Latest edition)
- B. Code Conflicts: Should conflicts exist between the referenced NFPA Standards, Federal, State or local codes and this specification, it shall be Contractor's responsibility to bring the conflict to the attention of Owner for resolution. The contractor shall not attempt to resolve code conflicts with the local authority, independent of Owner. In general, in the event of a conflict, the most stringent of the requirements will apply.
- C. Permit Fees: Contractor shall be responsible for filing all documents, paying all fees and securing all permits, inspections and approvals necessary for completing the scope of the work in this section.
- D. Equipment: All devices, systems, equipment and materials furnished and installed shall be new and shall be submitted for approval by Owner. All sprinklers, pipe, fittings, hangers, valves, and other materials and equipment shall be UL Listed and/or FM approved for their intended use. All shall be acceptable to the AHJ when such agencies have listings of acceptable equipment.
- E. Fittings: Fittings may be of the flanged, threaded, or grooved type. Welded outlets on cross-mains for riser nipples and/or branch lines, and for sprinkler outlets on branch lines will be permitted. All shall be UL Listed and/or FM approved for their intended use. The use of plain-end fittings to join steel pipe is not permitted.
- F. Contractor Requirements: Contractor shall:

1. Hold all licenses and obtain all permits necessary to perform work of this type in the State of Georgia. Copies of Contractor's licenses shall be provided with bid submittal.
2. Be regularly engaged, for the past five years in the design, installation, testing and servicing of automatic sprinkler systems for buildings of this type.
3. Contractor's site supervisor will be at the job site at all times when work is actively in progress.

1.05 SPRINKLER SYSTEM DESIGN CRITERIA

- A. Densities: Hydraulically designed and calculated sprinkler system(s) shall be installed in accordance with the construction documents. The system(s) has (have) been designed to produce discharge densities of:
 1. 0.15 gpm/square foot over the hydraulically most remote 1,500-square-feet (Ordinary Hazard Group I Occupancies).
- B. Sprinklers under ducts (or other): Provide sprinklers under ducts, stairs, and other obstructions as required by NFPA 13.
- C. All branch line piping shall be minimum 1" nominal size. Branch line piping in gridded systems shall be minimum 1¼" nominal size. Threaded outlets on branch lines supplying sprinklers shall match the sprinkler threads, but shall be 1" NPT if supplying a sprig or drop.

1.06 SUBMITTALS

- A. Shop Drawings: Contractor will be authorized to start the project or portions of the project when the shop drawings for the work are received, reviewed and approved by Owner and all AHJ. Installation prior to these approvals shall be at this Contractor's risk.
 1. Shop drawings shall show all of the information required by the applicable NFPA codes for working plans.
 2. Shop drawings shall include a drawing legend sheet identifying:
 - a. All symbols used on the drawings, by type of device or equipment, manufacturer and manufacturer's part number. This information shall correspond to the manufacturer's catalog data sheets and installation manuals.

- b. All conventions, abbreviations and specialized terminology used on the drawings, as necessary to understand and interpret the information contained therein.
 - c. A complete drawing list identifying all drawings in the shop drawing package by title, drawing number and Specification cross reference.
- 3. Shop drawings shall be single line or architectural floor plan drawings, drawn to 1/8-inch equals 1 foot scale or larger (i.e., 1/4-inch, etc.), showing a key plan and all other information required by the applicable NFPA codes for shop drawings.
- B. Product Data: Contractor shall submit a product data submittal with the shop drawings. Manufacturers' Data Sheets shall show the type and model of all equipment or material proposed. All manufacturers' data sheets shall clearly show all UL listings and/or FM approvals for each product submitted.
- C. All drawings and diagrams shall be prepared on drawing sheets of uniform size, 30 by 42 inches minimum, and shall contain no extraneous information. Marked up electrical, HVAC, or similar drawings or copies of catalog data sheets are not acceptable in lieu of the required drawings or diagrams. All other information required for this submittal shall be submitted in one or more appropriately labeled (i.e., Contractor's name, project, submittal name/description and date) and indexed 3-ring binders.
- D. All Drawings and diagrams shall include Contractor's title block, complete with drawing title, Contractor's name, address, date including revisions, and preparer's and reviewers initials. All drawings and diagrams shall be reviewed and stamped by a registered Fire Protection Engineer, as required by the AHJ.
- E. Samples: Within 30 days of authorization to proceed, Contractor shall submit to Owner for approval, samples of all types of proposed sprinklers, including types of finishes available and a complete list of where each type and finish will be installed.
- F. Prior to start of installation, Contractor shall submit copies of all permits and approvals to Owner necessary to conduct this work. A minimum of one complete set of such permits and approvals shall be kept by Contractor at the job site and shall be available for review.
- G. Contractor shall provide Owner with one copy of all documents that are reviewed and approved by the AHJ and/or local code authorities. These documents shall include, but not be limited to, the following:
 - 1. Site inspection forms
 - 2. Shop drawings
 - 3. Final inspection forms

All documents shall include all required approval stamps, signatures or other information necessary to properly certify that the installation has been reviewed and accepted by the AHJ.

- H. Final O&M Manual: Within 30 days of the completion of the work, 5 final copies of the approved manual with reduced drawings and test certificates shall be delivered to the Owner.
- I. Record Drawings: Contractor shall provide and maintain on the site an up-to-date 'as-built' record set of approved shop drawing prints which shall be marked to show each and every change made to the sprinkler system from the original approved shop drawings. This requirement shall not be construed as authorization to deviate from or make changes to the shop drawings approved by Owner without written instruction from Owner in each case. These drawings shall be maintained in a current condition at all times and shall be made available for review immediately upon request during normal working hours throughout the installation.
- J. Upon completion of the 'as-built' record drawings and before final approval, one set of reproducible 'as-built' record drawings shall be delivered to Owner.
- K. If Contractor's submittals, upon review by Owner, do not conform to the requirements of these specifications, Contractor shall be required to resubmit with modifications, within ten (10) working days of receipt of Owner's notification to Contractor. Contractor shall be responsible for Owner's expenses for subsequent review of rejected submittals that were necessitated by Contractor's failure to make the requested modifications.

1.07 WARRANTY AND EMERGENCY SERVICE

- A. Contractor shall warrantee all materials and workmanship for a period of one (1) year beginning with the date of final acceptance of Contractor's completed installation by Owner. Contractor shall be responsible during the design, installation, testing and warranty periods for any damage caused by Contractor (or its subcontractors) or by defects in Contractor's (or its subcontractors') work, materials, or equipment.
- B. Emergency Service: During the installation and warranty period, Contractor shall provide emergency repair service for the sprinkler (and standpipe) system(s) within four (4) hours of a request by Owner for such service. This service shall be provided on a 24-hour per day, seven days per week basis.

1.08 FINAL ACCEPTANCE

- A. Date of Final Acceptance will be established by Owner and shall be based on acceptance of the installation and required approved documentation by Owner and AHJ.

PART 2 - SYSTEM REQUIREMENTS

2.01 GENERAL

All equipment and system components furnished and installed shall be new and of first quality, and be listed by Underwriters Laboratories Inc. (UL), and/or approved by Factory Mutual (FM) for their intended use. All such equipment and system components shall be installed in accordance with the respective UL listings and/or FM approvals. All materials shall be acceptable to AHJ.

2.02 PIPE AND FITTINGS - GENERAL

- A. Pressure ratings: Pressure ratings of all fittings shall meet or exceed maximum working pressures available within the system.
- B. Corrosion protection: All piping and hangers, where exposed to the weather or installed in a corrosive atmosphere, shall be protected against corrosion. Piping and hangers in such areas shall be stainless steel and/or hot dipped galvanized. Piping having an external only galvanized finish in such areas is unacceptable.
- C. Fire Department Connections: Provide fire department connection(s) with proper pipe size and check valve(s) in the locations shown on the drawing. Check valve(s) should be located, if possible, at an interior low point prior to the exterior wall penetration. Fire department connection(s) are to be Fire Department inlet threads are to match local fire department thread specification. Do not locate valve(s) above ceilings unless specifically approved by Owner.

2.03 ABOVEGROUND PIPING COMPONENTS

- A. Pipe Sizes 2.5 inches (65 mm) and Larger.
 - 1. Piping shall be ASTM A-53/A-135/A-795, Weight Class STD (Standard), Schedule 40 (except for Schedule 30 for pipe sizes 8 inches (200 mm) and greater in diameter), Type E or Type S, Grade A; black steel pipe. Steel pipe shall be joined by means of flanges welded or screwed to the pipe, threaded fittings, or grooved couplings only. Piping shall not be joined by welding or weld fittings.
 - 2. Thinwall Pipe: Schedule 10 Pipe meeting ASTM A-53, A-135 or A-795 requirements with grooved pipe couplings and fittings. Grooves in Schedule 10 pipe shall be rolled groove only. Pipe having wall thicknesses less than Schedule 10 are unacceptable.
- B. Piping Sizes 2 inches (50 mm) and Smaller

4. Steel Pipe: Steel piping shall be ASTM A-53/A-135/A-795, Weight Class STD (Standard), Schedule 40, Type E or Type S, Grade A, steel pipe with threaded end connections. Fittings shall be ASME B16.39, Class 150, cast or ductile iron threaded fittings. Unions shall be ASME B16.39, Class 150, unions. Pipe may also be joined using grooved couplings and fittings. Where grooved joining is used, cut or rolled grooves are acceptable.

C. Pipe Hangers and Supports

1. Pipe hangers and supports shall be UL listed and/or FM approved, and shall be the adjustable type. Installation shall be according to the manufacturers' listing.

2.04 SPRINKLERS

- A. Contractor shall furnish and install fire sprinklers as indicated on the plans.
- B. Final Selection: Owner will select finishes for all automatic sprinklers and escutcheons.
- C. Uniformity: All sprinklers within a space shall be from the same manufacturer and shall have the same type and style of heat response element, including temperature rating and response characteristics.
- D. Temperature Rating: It shall be Contractor's responsibility to install sprinklers of the proper temperature rating as required by NFPA 13. Quick response sprinklers shall be provided.
- E. Corrosion Resistance: Sprinklers located on exterior piping systems or in areas exposed to corrosive atmospheres shall be UL listed and/or FM approved corrosion resistant coated or stainless steel.
- F. Sprinkler Escutcheons: Flush sprinkler escutcheons shall be metal and shall be listed for use with the sprinklers. Recessed sprinklers and escutcheons shall be UL listed and/or FM approved as an assembly, and the sprinkler and escutcheon shall be of the same manufacturer.
- G. Sprinkler Orifice: Sprinklers having a nominal 'K' factor of less than 5.6 are not acceptable unless specifically allowed by NFPA 13. The orifice size shall be uniform within a protected area.
- H. All sprinklers in finished areas shall be center of tile plus or minus 1/2 inch, unless approved by the Owner. All sprinklers shall be aligned in all directions when multiple sprinklers are in the same area and are in the same line of sight.

PART 3 - EXECUTION

3.01 WORKING CONDITIONS

- A. Contractor shall visit the site and become familiar with the conditions under which the work will be performed.
- B. Contractor's installation shall be performed from Monday through Friday between the hours of 7:30 a.m. and 5:30 p.m. Contractor will have site access during working hours.

3.02 PREPARATION FOR WORK

- A. Cooperation with other trades: Contractor shall coordinate with the work of the other trades towards the general purpose of having the construction progress as rapidly and as smoothly as possible with a minimum of interference between trades.
- B. Before the start of Structural Work, Contractor shall submit to Owner locations, sizes, and instructions for openings and penetrations required for his work. Submittal and proposed penetrations shall be subject to Owner's approval. Contractor shall provide any additional penetrations or openings or relocation required, that were not addressed in their initial submittal at no additional cost to Owner. In general, penetrations of primary structural members are not permitted.
- C. Approval prior to installation: No work shall commence prior to approval of shop drawings by the approving authorities, including Owner. Any change in work that has been installed prior to approval of the shop drawings shall be made without additional compensation to Contractor.

3.03 GENERAL INSTALLATION

- A. Aesthetics shall be a primary consideration when installing sprinklers and sprinkler piping in all areas. Any facet of sprinkler installation that deviates from the approved shop drawings and does not meet with Owner's approval shall be revised by Contractor to Owner's satisfaction at no additional cost.
- B. All holes made by Contractor in any wall, ceiling, or floor shall be patched by Contractor, restoring the wall, ceiling, floor or member to its original condition, fire resistance, and integrity.
- C. Location of all equipment, controls, piping, valves and drains shall be subject to Owner's approval.
- D. All sprinklers and equipment shall be installed in accordance with manufacturers' instructions. All special tools, including sprinkler wrenches, recommended by the manufacturer shall be used.

- E. Sprinklers shall be installed with the deflector to ceiling distances in accordance with their UL listings and/or FM approval and the requirements of NFPA 13.

3.04 PIPING

- A. All sprinkler piping installed in public areas or non-public areas with suspended ceilings shall be concealed in the walls, ceilings or soffits. Pipe in unfinished areas may be exposed.
- B. All piping exposed within the building public areas shall be painted with one coat by Contractor. Owner is to select the colors.
- C. Escutcheon Plates: All exposed pipe which passes through a wall, ceiling, or floor shall be provided with metal escutcheon plates.
- D. Minimum Height: All exposed piping and devices shall be installed as high as possible, but no less than seven (7) feet clear above the finished floor in traffic or working areas, so as not to obstruct any portion of a window, doorway, stairway or passageway. Pipe and fittings shall not interfere with the operation or accessibility of any mechanical, plumbing or electrical equipment.
- E. Protection: Contractor shall provide Owner approved, adequate permanent protection for any installed piping, valves, devices or accessories which, in Owner's opinion, are subject to physical damage or may be hazards.
- F. Firestopping: Pipe that passes through fire-rated resistive barriers (including shaft walls) shall be sleeved and grouted or sealed to maintain the integrity and rating of the fire resistive barrier.
- G. Testing: All piping is to be flushed and hydraulically tested prior to acceptance by owner. Flushing and testing must be performed in accordance with NFPA standards.
- H. Contractor shall provide all equipment necessary for testing and flushing and any special equipment required for the installation of any portion sprinkler (and/or standpipe) system(s). Contractor shall remove all such equipment at the end of the job.

3.05 FLUSHING AND SANITIZATION

- A. All equipment and materials prior to installation shall be clean inside and outside. All waste material such as chips, filings, welding stubs, dirt, rags, debris, and any other foreign material shall be removed from the components before assembly.
- B. All steel pipe coupons or punched holes for welded or mechanical outlets shall be attached to the pipe near the pipe hole. Protective plastic caps shall be located over openings and pipe ends during installation to prevent foreign material from entering the pipe at any time.

3.06 FINAL INSPECTION AND TEST

- A. Contractor shall make arrangements with Owner for Owner's final inspection and witnessing of the final acceptance tests. This test shall be separate from testing by the local authorities.
- B. All tests and inspections required by the referenced Codes and Standards, AHJ, and Owner shall be conducted by Contractor under this scope of work.
 - 1. When AHJ are required to witness tests, Contractor shall be responsible for making all necessary arrangements with the code authorities and coordinating the testing with Owner.
 - 2. Contractor shall be responsible for completing all test documents with necessary approval stamps and signatures of the AHJ. Contractor shall submit one copy of each of these documents to Owner for their records.
- C. Acceptance Testing: Upon completion of each system, perform and document on an NFPA or approved format, system tests as described herein. All acceptance tests shall be performed in the presence of Owner.
 - 1. Hydrostatic tests.
 - 2. Flushing of piping.
 - 3. Test of sprinkler supervisory system - The Alarm and Detection Contractor should be present at the testing of all sprinkler alarm and supervisory devices. This Contractor shall coordinate the final testing of all such devices with the Alarm and Detection Contractor.
- D. Contractor shall provide at least five (5) working days notice for all tests to all involved.

3.06.1 Final Approval:

- A. Final approval and acceptance of the work will be given by Owner when:
 - 1. The completed sprinkler system(s) has (have) been inspected, tested and approved by Owner and AHJ.
 - 2. Required submittals, system operation and maintenance manuals, record drawings, spare parts, special tools and training have been provided to, reviewed, and accepted by Owner.
 - 3. Written certification is submitted that states all equipment has been inspected and tested by a manufacturer's certified representative.

4. Written certification is submitted that states all equipment is installed in accordance with the manufacturer's recommendations and UL and/or FM approvals.
- B. Additional Tests: Any additional tests, required by the referenced codes, standards, or criteria, or by Owner, shall be performed. This documentation shall include:
1. The date and time of each test.
 2. A reference set of contractor record drawings, numerically identifying the individual components and circuits tested, test locations, and indicating the measured sound level in each corridor and guest room location.
 3. A description of each test performed.
 4. A checklist of each device tested, indicating the results of each test.
 5. The names and signatures of the individuals conducting and witnessing each test.

END OF SECTION

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