

**SECTION 210500****COMMON WORK RESULTS FOR FIRE SUPPRESSION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pipe, fittings, valves, and connections for sprinkler systems.

**1.02 RELATED REQUIREMENTS**

- A. Section 210553 - Identification for Fire Suppression Piping and Equipment: Piping identification.
- B. Section 211300 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.

**1.03 REFERENCE STANDARDS**

- A. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2007.
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; The American Society of Mechanical Engineers; 2005.
- C. ASME B16.4 - Gray Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- D. ASME B16.5 - Pipe Flanges and Flanged Fittings; The American Society of Mechanical Engineers; 2003 (ANSI/ASME B16.5).
- E. ASME B16.9 - Factory-made Wrought Steel Buttwelding Fittings; The American Society of Mechanical Engineers; 2007.
- F. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2007.
- G. ASTM A 795/A 795M - Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use; 2008.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2008.
- I. AWWA C110/A21.10 - American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75 mm Through 1200 mm), for Water and Other Liquids; American Water Works Association; 2003.
- J. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2007 (ANSI/AWWA C111/A21.11).
- K. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 2002, and Errata 2002 (ANSI/AWWA C151/A21.51).
- L. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2007.
- M. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances; National Fire Protection Association; 1995.
- N. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.
- O. UL 262 - Gate Valves for Fire-Protection Service; Underwriters Laboratories Inc.; 2004.
- P. UL 312 - Check Valves for Fire-Protection Service; Underwriters Laboratories Inc.; 2004.

**1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
- D. Project Record Documents: Record actual locations of components and tag numbering.
- E. Operation and Maintenance Data: Include installation instructions and spare parts lists.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Designer Qualifications: Design system under direct supervision of a Professional Fire Protection Engineer experienced in design of this type of work and licensed in Ohio.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience. approved by manufacturer.
- D. Conform to UL, FM, and Warnock Hersey requirements.
- E. Valves: Bear UL label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- F. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store valves in shipping containers, with labelling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

### **PART 2 PRODUCTS**

#### **2.01 FIRE PROTECTION SYSTEMS**

- A. Sprinkler Systems: Conform work to NFPA 13.
- B. Welding Materials and Procedures: Conform to ASME Code.

#### **2.02 BURIED PIPING**

- A. Cast Iron Pipe: AWWA C151/A21.51.
  - 1. Fittings: AWWA C110, standard thickness.
  - 2. Joints: AWWA C111, rubber gasket.
  - 3. Mechanical Couplings: Shaped composition sealing gasket, steel bolts, nuts, and washers.

#### **2.03 ABOVE GROUND PIPING**

- A. Steel Pipe: ASTM A 53 Schedule 40, black.
  - 1. Steel Fittings: ASME B16.9, wrought steel, buttwelded.
  - 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
  - 3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

**2.04 PIPE HANGERS AND SUPPORTS**

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.

**2.05 GATE VALVES**

- A. Valves shall be Class 175 U.L. listed and approved for Fire Protection Service.
- B. Gate valves 2-1/2" and larger shall be outside screw and yoke type.
- C. Manufacturers:
  - 1. Mueller
  - 2. Crane
  - 3. Stockham
  - 4. Grinnell
  - 5. Victaulic

**2.06 BALL VALVES**

- A. Valves shall be Class 175 U.L. listed and approved for Fire Protection Service.
- B. Manufacturers:
  - 1. Mueller
  - 2. Crane
  - 3. Stockham
  - 4. Grinnell
  - 5. Victaulic

**2.07 CHECK VALVES**

- A. Valves shall be Class 175 U.L. listed and approved for fire protection service.
- B. Manufacturers:
  - 1. Mueller
  - 2. Crane
  - 3. Stockham
  - 4. Grinnell
  - 5. Victaulic

**2.08 DRAIN VALVES**

- A. Combination test and drain valves will be acceptable. Use "ABT" or approved equal.
- B. Ball Valve: For drain only.
  - 1. Brass with cap and chain, 3/4 inch hose thread.

**PART 3 EXECUTION****3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.

### **3.02 INSTALLATION**

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Sleeve pipes passing through partitions, walls, and floors.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Pipe Hangers and Supports:
  - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 2. Place hangers within 12 inches of each horizontal elbow.
  - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  - 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- I. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding. Refer to Section 099000.
- J. Do not penetrate building structural members unless indicated.
- K. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- L. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
- M. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
- N. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.
- O. Provide gate valves for shut-off or isolating service.
- P. Provide drain valves at main shut-off valves, low points of piping and apparatus.

**END OF SECTION**

**SECTION 210502****FIRE PROTECTION GENERAL PROVISIONS****PART 1 GENERAL****1.01 GENERAL REQUIREMENTS**

- A. Furnish all labor, material and equipment and install complete all work hereinafter specified and as shown on the Drawings, and any and all details essential to complete the installations, whether same are specifically mentioned or not. Any material or labor which is neither shown on the Drawings, nor called for in the Specifications, but which is obviously necessary to complete the work and which is usually included in work of a similar character, shall be furnished and installed without additional cost.
- B. Read all Specifications and Drawings covering all branches of work so as to be fully informed as to the work to be done as a part of this Contract and the work to be done by other Contractors.
- C. The Drawings are complementary to the Specifications. Whatever is called for by one shall apply to both unless specifically stated or shown as otherwise. Any discrepancies shall be clarified with the Architect during time of Bidding.
- D. The piping layout is schematic. Exact locations shall be determined on the job by structural and other conditions. This does not mean that the design of the system may be changed, it refers only to the exact locations of piping, ductwork and equipment to fit into the Building as constructed.
- E. All material and equipment shall be new, undeteriorated, and of a quality not less than the minimum specified herein.
- F. All workmanship shall be in accordance with the best practices of the trade as determined by the representatives of the Architect. At all times, the work shall be under the directions of a competent foreman.
- G. Architect reserves the right to direct the removal and replacement of any item of work which, in his opinion, does not present an orderly, reasonably neat and workmanlike appearance, provided such items can be properly installed in such orderly way by methods usual in such work. Such removals or replacements to be done by this Contractor when so directed by the Architect and all cost in connection therewith to be paid by this Contractor.
- H. Work found unacceptable by testing procedures, inspection agencies or the Architect shall be immediately corrected at no additional cost to the Owner. Work will be considered unacceptable when it is contrary to the Specifications, governing codes or accepted standards of good workmanship.
- I. Insofar as this branch of work is concerned, keep premises in neat and orderly condition and promptly clean up and cart away debris and excess material from the job site.
- J. Several makes of equipment are listed for each of the manufactured items in this Specification. Because of restricted space for the equipment, the responsibility for any deviation from the dimensions of the base equipment and possible consequent interferences shall be with the equipment supplier through this Contractor. Submittal of such equipment will be considered as a statement by the Contractor and manufacturer that clearances have been checked and found adequate.
- K. The contractor shall install all equipment in accordance with the manufacturer's installation instructions, including clearances for maintenance, necessary supports, proper torque, necessary accessories for an operable system, lubrication prior to start-up, belt tension, etc. If manufacturer's instructions conflict with the Drawings, Specifications, or applicable building

codes, the Contractor shall bring such conflicts to the attention of the Engineer who shall determine which requirements apply.

- L. Visit site during bidding period to review the documents and become acquainted with all features of work to be performed. Failure to inspect the site prior to bidding will not relieve Contractor of performance of any item of work required by existing conditions.
- M. This contractor shall remove and relocate any existing electrical conduit, piping, sheet metal, utilities, equipment or structure of any nature that conflicts with the installation of the work proposed under this contract, unless specifically shown to be done by another contractor. If required to remain in use, relocate items as directed by the Architect or Engineer and reinstall complete and operational with new extensions, modification, start-up and check-out as needed.
- N. Contractor shall acquaint himself with the location and size of all existing piping and utilities before any work is begun. Damage to any piping and utilities shall be a liability of the Contractor whether or not plotted on the Drawings, and all damages shall be promptly repaired or replaced to the full satisfaction of the Architect.
- O. The materials and equipment specified are set up as a "standard" and the Base Bid must be submitted on this basis. See "Instructions to Bidders".
- P. In order to hold shut down times to a minimum, the Contractor shall install any additional valves that will be required to isolate sections of piping to satisfy the phased progress of all work.
- Q. All hardware, software and firmware installed under this contract, individually and in combination with each other shall function free of any fault in processing dates, and any information related to dates, (including calculating, comparing and sequencing information and/or functions which depend on dates) through and beyond January 1, 2000. Such fault free operation shall not require any modification after the system is installed and it shall be transparent to the user.
  - 1. If the hardware and/or software installed under this contract interacts with any existing systems which do not already have this feature, this Contractor is to notify the Owner, in writing and in a timely manner, of the specific changes which the Owner must make to the existing systems to bring the combined system into compliance with this requirement.

## **1.02 CODES, INSPECTIONS AND PERMITS**

- A. Work is to be performed and installed in compliance with the Ohio Building Code and NFPA.
- B. Create Shop Drawings and perform Calculations in strict compliance with NFPA 13 and the Authority Having Jurisdiction. The Shop Drawings and Calculations shall be submitted to the Architect for approval. After approval, submit to the Plans Examiners to finalize the Fire Protection Permit.
- C. Refer to General Conditions Article 2.9 for building and trade permits and licenses.
- D. Secure all necessary permits and licenses and file with the authorities required Drawings and complete the work in accordance with same. Furnish the Owner with all acceptance certificates.
- E. Where quantities, sizes or other requirements of the Drawings or Specifications are in excess of applicable code requirements, the Contractor shall comply with the Drawings or Specifications.
- F. Pressure piping systems installed shall conform to the requirements of the Ohio Revised Code, Title XLI- Labor and Industry, Chapter 4104- Division of Boiler Inspection, Piping Systems, 4104.41 to 4104.99.
- G. Inspections will be performed by the Ohio Building Code Department.
- H. Inspections will be performed by the Delaware County Coed Compliance

## **1.03 LAYOUTS AND COORDINATION**

- A. The Contractor shall at all times keep himself fully informed of the progress of the general construction, and shall install all of his work that is concealed and built into the Building in sufficient time to ensure proper location without delays to the work of the other trades. Properly attend the work during progress of the building to prevent misalignments and damages to this work or the work of other Divisions.
- B. The Contractor shall take measurements after consulting all Drawings and be responsible for same and shall layout and execute the work so as not to interfere with or delay the other Contractors on this Project.
- C. Where piping, sheet metal, plumbing, fire protection or electrical equipment must be installed in restricted areas, the superintendents of the various trades shall coordinate their efforts prior to installation. Should this provision be ignored, or should relocation of equipment be necessary to provide clearances for other equipment, such relocation shall be directed by the Architect and shall be done at no change in price.
- D. It shall be the Contractor's responsibility to see that all equipment and other apparatus that may require maintenance from time to time is made easily accessible. Although the location of the equipment may be as shown on the Drawings, the construction of the structure may disclose that such location of equipment does not make its position readily accessible; therefore, the Contractor shall call the attention of the Architect to the condition before advancing the construction to a point where a change in the location would reflect additional cost.
- E. The exact location of apparatus, equipment, etc., shall be given from time to time as the work progresses and the contractor shall ascertain such locations from the Architect or his representative and shall lay out the work accordingly. Should the Contractor fail to ascertain such locations the work shall be changed when so ordered by the Architect. The Architect reserves the right to make minor changes in the locations of equipment and its related material up to the time of roughing-in without additional cost.

#### **1.04 EMERGENCY SERVICE**

- A. Emergency service shall be provided for installation or equipment failures in any part of the Fire Protection work and all controls, on verbal demand, prior to final acceptance and during the Guarantee period.
- B. The Owner will designate three (3) individuals who will initiate the call for emergency service. The Contractor shall, in turn, designate three (3) individuals, together with current telephone numbers, who will and can perform the emergency service.
- C. Emergency services performed which are not due to defects of work or materials supplied by this Contractor will be paid by the Owner.

#### **1.05 GUARANTEE: Refer to "General Conditions" and Division 1.**

#### **1.06 SHOP DRAWINGS AND SUBMITTALS**

- A. Refer to the General Conditions and Division 1.
- B. Designer Qualifications: Design system under direct supervision of a Professional Fire Protection Engineer experienced in design of this type of work and licensed in Ohio.
- C. Submit shop drawings and manufacturers submittals for review for the following items:
  - 1. Supports and Anchors
  - 2. Valves
  - 3. Flexible Connections
  - 4. Gauges
  - 5. Firestop Material
  - 6. Fire Protection Equipment

- a. Sprinklers
  - b. Fire alarm valves
  - c. Flow and tamper switches
  - d. Fire department connection
  - e. Pipe and joint materials
  - f. Special equipment
- D. The Contractor shall check all manufacturer's Drawings for conformance to the Plans and Specifications and shall indicate his approval of the Drawings before forwarding them to the Architect. The Architect will not consider any manufacturer's Drawings for review which do not bear the Contractor's stamp of approval.
- E. The Architect's and Engineer's review of manufacturer's Drawings or schedules shall not relieve the Contractor from responsibility for errors or omissions in manufacturer's Drawings and deviations from the Architect's Drawings or Specifications.
- F. Each submittal to be complete with a title sheet stating the project name and location, Architect, Engineer, Contractor and a table of contents.
- G. Shop Drawings shall include diagrams showing only those devices and options furnished with each piece of equipment. Manufacturer's "standard" diagrams will not be accepted.
- H. The quantities required of each individual item of equipment will not be reviewed by the Architect or Engineer. The quantities needed to complete the project are the sole responsibility of the Contractor.

#### **1.07 OPERATION - MAINTENANCE MANUAL, PERSONNEL INSTRUCTION AND RECORD DRAWINGS**

- A. Operation - Maintenance Manual
1. This Contractor shall submit one (1) bound copy in 8-1/2" x 11" hard fiber binder for approval. After approval, furnish four (4) copies to the Architect.
  2. Format of Manual to be as follows:
    - a. First Page: Title of Job, Project Number, Owner, address, Date of Submittal, Name and Address of Contractor, Name of Architect, Name of Engineer.
    - b. Second Page: Index.
    - c. First Section: Written description of each system, where located in the building, how each part functions individually and how systems work as a whole. Conclude with list of items requiring service and the service needed or reference to the manufacturer's data in the Maintenance Manual which describes proper service.
    - d. Second Section: A copy of each shop drawing and/or submittal (final record issue) with an index at beginning of the Section.
    - e. Third Section: A copy of each manufacturer's operating and maintenance instructions with an index at the beginning of the section.
    - f. Fourth Section: A list of all equipment used on the job, together with Contractor's purchase orders and supplier's name and address.
- B. Personnel Instruction: Provide a minimum of two (2) hours total instruction to personnel selected by the Owner. Instructions shall include the following:
1. Location of items of equipment and explanation of what they do.
  2. Reference to Operation Maintenance Manual for record and clarity.
  3. Coordination of written and verbal instruction so that each is understood by personnel. Advise on maintenance and repairs.
  4. Prepare a certificate to be signed by the person or persons being instructed. Certificate shall indicate date and time instructions were given, by whom given, and that the persons receiving the instructions fully understood the system operation.

- C. Record Set of Contract Drawings
1. Provide a clean set of Contract Drawing prints marked in red pencil, showing all deviations from the Contract Drawings. Record Drawings shall show all underground piping by dimension from building walls, and depth below grade or slab.
  2. Prints to be maintained at Project and kept current every day with job progress throughout Contract period.
  3. Upon completion of the project and before final approval neatly transcribe (in red pencil only) these deviations from the field drawings to a separate clean set of record drawings. Certify to the accuracy of each print by signature and date thereon and deliver same to the Architect.
  4. Fire Protection contractor shall update their shop drawings in AutoCad 2006 format. Updated drawings shall be given to the Architect in electronic format on CD-Rom disk.

#### **1.08 JOB CLOSING SUBMITTALS**

- A. Following submittals to be forwarded to the Architect prior to building acceptance.
1. Operation and Maintenance Manuals.
  2. Certificate from designated personnel that they have received instructions and understand operations of systems.
  3. Record Drawings.
  4. Valve and Equipment Charts.
  5. Written letter of Guarantee and Warranties.
  6. Written notification of Punch List completion.
  7. Return of any building keys.
  8. Written letter of completion.
  9. Final payment request.
  10. Waiver of Lien.
  11. Certified payroll affidavit.
  12. Fire Protection submittals
    - a. Contractor's Material and Test Certificate
    - b. Certificate of Underwriter's Acceptance Test on the fire pump.
    - c. National Automatic Sprinkler and Fire Control Association Form of Inspection Agreement.
- B. Refer to Division I - General Requirements for additional closeout submittals.

#### **1.09 INSPECTION OF SITE**

- A. Prospective bidders shall visit the Site during the bidding period and become acquainted with all features of the work to be performed. Failure to inspect the Site prior to bidding shall not relieve the Contractor of the performance of any item of work required by existing conditions in evidence.

#### **1.10 TEMPORARY FACILITIES**

- A. Refer to Division I.

#### **1.11 CONSTRUCTION SCHEDULE AND PHASING**

- A. Upon approval of Contract, prepare a schedule, prior to starting operations, of all stages of work and sequence to be performed.
- B. Scheduling and associated approval procedures to be in accordance with General Conditions and Division 1 - General Requirements or as instructed by the Architect.
- C. Refer to Division 1 - General Requirements for areas of Building where special scheduling of work and restricted working hours will be in effect.

- D. The Architect in conjunction with the Owner, shall alone determine availability of spaces. No work to be performed which will hinder normal functions without expressed permission.
- E. Scheduling of work to be coordinated with delivery schedules and work schedules prepared by other Contractors directly involved.
- F. Fire Protection outages to be scheduled and approved in advance with the Owner in coordination with the Architect.
- G. Materials and equipment required during a scheduled outage are to be on hand prior to starting of operations in order to ensure expeditious conclusion.
- H. The adjacent building will be occupied and in normal operation during entire period of construction. Work must be carefully coordinated and scheduled to minimize interference.

#### **1.12 INTERRUPTION OF OPERATIONS AND UTILITIES**

- A. Bidders are cautioned that disruption of utility services may be done only as scheduled in advance with the Architect and as approved by the Owner whose approval shall be final and binding to the Contract.
- B. Interruption of Fire Protection services necessary for the reconnections of this Contract work shall be scheduled as follows:
  - 1. Submit a request in writing to the Architect at least fourteen (14) days in advance of the desired outages. Request shall state the service proposed for interruption, the duration of the interruption, the areas affected and an optional date or dates for the interruption. The request shall further certify that all materials and equipment necessary for completing work involved in the outage is on hand at the Site.
- C. The decision of the scheduled times of interruption by the Architect shall be final and binding on the Contract and no claim for extra compensation to the Contract may be made for overtime work necessary for interruptions outside of normal working hours.
- D. Work in corridors and traffic areas shall be scheduled and carried on so as not to impede, hamper, or be a nuisance to employees or staff. Daily clean up of debris is required.

#### **PART 2 PRODUCTS**

**2.01 Not Used.**

#### **PART 3 EXECUTION**

**3.01 Not Used.**

**END OF SECTION**

**SECTION 210553****IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Stencils.
- D. Pipe Markers.

**1.02 RELATED REQUIREMENTS**

- A. Section 099000 - Painting and Coating: Identification painting.

**1.03 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; The American Society of Mechanical Engineers; 2007.

**1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- D. Product Data: Provide manufacturers catalog literature for each product required.
- E. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
- F. Project Record Documents: Record actual locations of tagged valves.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
- B. Champion America, Inc: [www.Champion-America.com](http://www.Champion-America.com).
- C. Seton Identification Products: [www.seton.com/aec](http://www.seton.com/aec).

**2.02 NAMEPLATES**

- A. Description: Laminated three-layer plastic with engraved letters.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/4 inch.
  - 3. Background Color: Black.

**2.03 TAGS**

- A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
- B. Chart: Typewritten letter size list in anodized aluminum frame.

**2.04 STENCILS**

- A. Stencils: With clean cut symbols and letters of following size:
  - 1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
  - 2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
  - 3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
- B. Stencil Paint: As specified in Section 099000, semi-gloss enamel, colors conforming to ASME A13.1.

## **2.05 PIPE MARKERS**

- A. Color: Conform to ASME A13.1.
- B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

## **2.06 CEILING TACKS**

- A. Description: Steel with 3/4 inch diameter color coded head.
- B. Color code as follows:
  - 1. Red - Sprinkler valves

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Section 099000 for stencil painting.

### **3.02 INSTALLATION**

- A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Apply stencil painting in accordance with Section 099000.
- D. Install plastic pipe markers in accordance with manufacturer's instructions.
- E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Identify control panels and major control components outside panels with plastic nameplates.
- H. Identify valves in main and branch piping with tags.
- I. Tag automatic controls, instruments, and relays. Key to control schematic.

- J. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- K. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

**END OF SECTION**

**SECTION 211300****FIRE-SUPPRESSION SPRINKLER SYSTEMS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. Dry-pipe sprinkler system.
- C. System design, installation, and certification.
- D. Fire department connections.

**1.02 RELATED REQUIREMENTS**

- A. Section 210500 - Common Work Results for Fire Suppression: Pipe, fittings, and valves.
- B. Section 220502 - Fire Protection General Provisions
- C. Section 210553 - Identification for Fire Suppression Piping and Equipment.
- D. Section 262717 - Equipment Wiring: Electrical characteristics and wiring connections.
- E. Section 331116 - Site Water Utility Distribution.

**1.03 REFERENCE STANDARDS**

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2007.
- C. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

**1.04 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
  - 1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
  - 2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
  - 3. Submit shop drawings to authority having jurisdiction for approval. Submit proof of approval to Architect.
  - 4. Submit a one line diagram for interconnections of initiation, troubles and alarms to existing Fire Alarm System.
- D. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
- E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
- F. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.

- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
  - 2. Sprinkler Wrenches: For each sprinkler type.

#### **1.05 QUALITY ASSURANCE**

- A. Conform to UL requirements.
- B. Designer Qualifications: Design system under direct supervision of a Professional Fire Protection Engineer experienced in design of this type of work and licensed in Ohio .
- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience approved by manufacturer.
- E. Equipment and Components: Provide products that bear UL label or marking.
- F. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

### **PART 2 PRODUCTS**

#### **2.01 SYSTEM MANUFACTURERS**

- A. Sprinklers, Valves, and Equipment:
  - 1. Tyco Fire Suppression & Building Products: [www.tyco-fire.com](http://www.tyco-fire.com).
  - 2. Reliable.
  - 3. Substitutions: See Section 016000 - Product Requirements.

#### **2.02 SPRINKLERS**

- A. Suspended Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate.
  - 1. Finish: Chrome plated.
  - 2. Escutcheon Plate Finish: Chrome plated.
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- B. Exposed Area Type: Standard upright type with guard.
  - 1. Finish: Brass.
  - 2. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- C. Sidewall Type: Standard horizontal sidewall type with matching push on escutcheon plate and guard.
  - 1. Finish: Chrome plated.
  - 2. Escutcheon Plate Finish: Brass.
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- D. Dry Sprinklers: Standard pendant type.
  - 1. Finish: Brass.
  - 2. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
- E. Guards: Finish to match sprinkler finish.
- F. Spray Nozzles: Brass with solid cone discharge, 30 degrees of arc.

### 2.03 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm, with pressure retard chamber and variable pressure trim; with test and drain valve.
- B. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with accelerator; with test and drain valve.
- C. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy chrome plated gong and motor housing, nylon bearings, and inlet strainer.
- D. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- E. Fire Department Connections:
  - 1. Type: Free standing type with ductile iron pedestal red enamel finish.
  - 2. Outlets: Two way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.
  - 3. Drain: 3/4 inch automatic drip, outside.
  - 4. Label: "Sprinkler - Fire Department Connection".
- F. Supervisory switches as manufactured by Potter.

### 2.04 AIR COMPRESSOR

- A. Manufacturers:
  - 1. Viking.
- B. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
- C. Compressor and receiver tank capacity to be based on system volume per NFPA 13.
- D. Compressor to maintain 100 PSIG with air cooled after cooler, mounted on ASME receiver. Furnish with inlet filter muffler, automatic tank drain, flexible metal hose connection to air piping, oil filter, and automatic pressure switch control. Unit shall be warranted to produce less than 6 PPM oil carry over.
- E. Refrigerated air dryer shall be Deltech No. HG10 or equal, a capacity to match compressor at 100 PSIG, 35 deg. F dewpoint with an automatic drain trap, wall mounted. 120 volt 1 phase.
- F. Compressor Electrical Characteristics:
  - 1. 1 hp.
  - 2. 480V 3 phase, 60 hertz

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Furnish and install a complete wet pipe fire protection system where indicated on the Drawings. The sprinkler system is to be supplied by the underground fire water service as shown on drawing.
- B. Furnish and install complete compressed air system for the preaction system to be completely operational.
- C. Install system in accordance with referenced NFPA design and installation standards.
- D. Install refrigerated air dryer in the air supply to the deluge valve.

- E. Install all equipment in accordance with manufacturer's instructions.
- F. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- G. Locate outside alarm gong on building wall as indicated.
- H. Place pipe runs to minimize obstruction to other work.
- I. Place piping in concealed spaces above finished ceilings.
- J. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- K. Flush entire piping system of foreign matter.
- L. Install guards on sprinklers where indicated.
- M. Hydrostatically test entire system per NFPA.
- N. Required test be witnessed by authority having jurisdiction.
- O. Adjust air regulator outlet pressure to maintain air pressure required to hold dry pipe valve closed against the maximum water pressure in the water supply pipe at the dry pipe valve.

### **3.02 INTERFACE WITH OTHER PRODUCTS**

- A. Ensure required devices are installed and connected as required to the existing fire alarm system.

**END OF SECTION**