

**PART 1 GENERAL****1.1 SECTION INCLUDES**

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

**1.2 RELATED REQUIREMENTS**

- A. Section 13925 - Fire Suppression Sprinklers: Sprinkler systems design.

**1.3 REFERENCE STANDARDS**

- A. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- B. ASTM A 47/A 47M - Standard Specification for Ferritic Malleable Iron Castings; 1999 (Reapproved 2004).
- C. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2002.
- D. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; 2000 with 2007 Georgia State Amendments.
- E. Georgia State Minimum Standard Fire Prevention Code, 2006 Edition, with 2007 Georgia State Amendments.
- F. Chapter 120-3-3 of the Rules of the Safety Fire Commissioner dated February 1, 2007.
- G. Georgia State Minimum Standard Building Code (International Building Code), 2006 Edition, with 2007 & 2009 Georgia State Amendments. NFPA Code, where more stringent, shall take precedence.

**1.4 SUBMITTALS**

- A. Refer to Section 15010.01 - General Plumbing 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. Provide reflective ceiling plan showing sprinklers coordinated with lights, diffusers and other equipment located in or on ceiling.
- D. Project Record Documents: Record actual locations of components and tag numbering.
- E. Operation and Maintenance Data: Include installation instructions and spare parts lists.

**1.5 QUALITY ASSURANCE**

- A. Fire Protection
  - 1. The Contractor expressly warrants that the company performing the installation of the fire protection systems has demonstrated proficiency in the installation, start-up and adjustment of such systems by the successful performance of work of the nature specified herein on at least 5 commercial or institutional buildings, each containing minimum of 10,000 ft<sup>2</sup> of protected area or greater.
  - 2. The Contractor further warrants that the aforesaid subcontractor has trained personnel, instruments, tools, and equipment to perform the installation specified.

3. The Contractor also warrants that the aforesaid installer has been in business performing services of the nature specified herein for at least the previous five consecutive years in the state of Georgia.
4. Provide a certificate of competency as issued by the Georgia State Fire Marshal's Office.

B. Conform to UL and FM requirements.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

## **1.7 EXTRA MATERIALS**

- A. Provide additional materials as provided in these specifications and by NFPA..

## **PART 2 PRODUCTS**

### **2.1 FIRE PROTECTION SYSTEMS**

- A. Sprinkler Systems: Conform work to NFPA 13.
- B. Welding Materials and Procedures: Conform to ASME Code.
- C. Building is light hazard. Pipe sizes shall be hydraulically calculated.
- D. Provide hydraulic calculations over the most remote 1500 square feet providing density required for hazard as indicated in NFPA 13. Minimum discharge pressure shall be 7.0 PSI. Minimum residual pressure at city water main in the street shall be 20.0 PSI. Provide 10.0 PSI minimum safety margin in hydraulic calculations at design point. Design area reduction per NFPA 13 is not allowed.
- E. Basis of design: Contractor shall perform, or have performed, at the same time, a Fire Flow and Twenty Four Hour Static Test to assure flow equals or exceeds specified basis of design flow rate prior to preparing shop drawings, installing system or performing calculations. Prepare calculations based on confirmed flow data or basis of design flow data, whichever is lowest. Flow test shall be performed in accordance with NFPA 13 and Rules and Regulations of Safety Fire Commissioner, O.C.G.A. Chapter 120-3-3. Modify flow test pressures (static and residual), if pressure recorded in 24 hour test is lower than flow test pressures for one hour duration, to lowest hour test pressure.
- F. No pipe shall be routed above electrical panels and equipment as required by National Electrical Code or on control side or beneath suspended mechanical equipment except where specifically required by Code, in which case, provisions shall be made for service access and removal of equipment.
- G. Where available, piping to sprinklers in all electrical and IT rooms, shall enter over interior doors.
- H. Inspectors test connection(s) shall discharge to the outside of the building in location(s) acceptable to the Architect.
- I. Inside auxiliary drains, if needed, shall discharge in location(s) acceptable to the Architect. Drain and test connection piping, if in finished space, shall be installed concealed.

### **2.2 ABOVE GROUND WET SYSTEM PIPING**

- A. Steel Pipe: ASTM A 795 Schedule 10 or ASTM A 53 Schedule 40, black. Piping 2" and smaller shall be treaded. Piping 2 1/2" and larger shall be grooved with rigid couplings.
  - 1. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
  - 2. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A 47/A 47M.
  - 3. Mechanical Grooved Couplings: Rigid malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe. Reducing couplings or flanges are NOT allowed.

### 2.3 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. Provide support for any vertical pipe 36" in length or greater except armovers. Provide supports 12'-0" O.C. maximum or at floor levels.
- E. Where branchlines or mains have piping to sprinklers ,armovers or to uprights,out one side or mostly on one side, provide hanger on every fourth armover, regardless of length, to prevent rotation of branchline or main.
- F. Threaded rods shall NOT be bent. Bending is permitted only in unthreaded sections of hanger rods. Bending shall occur as close to the hanger as possible. Provide a swivel assembly if required.

## PART 3 EXECUTION

### 3.1 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.
- D. Storage: All piping shall be stored above ground and protected to prevent dirt and debris from entering pipe.

### 3.2 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13 and these specifications.
- 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. All piping shall be installed above ceilings in a concealed manner except where no ceilings are present
- F. Sleeve pipes passing through partitions and walls.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

- H. Reducing Tees: Weld-on threaded outlet tees and Coupolet-300 by Bonney Forge Division of Energy Products Group, Central Sprink 701, "TEE-LET" 300 by Merit Manufacturing Corp., NAP300 by North Alabama Pipe Corp., F400 by Grinnell Corp. may be used for side outlet reducing tees more than two pipe sizes smaller than main. Discs shall be retrieved and connected to pipe at point of cutting. Cutting shall comply with NFPA 13, Chapter 6.5.2.9.
- I. Couplings may be used on gridded systems at only one end of each gridded branch line or on 2 1/2" or larger riser nipple to 2" or smaller branch line to facilitate connection provided that the coupling is connected to piping by a cut groove. Rolled grooves are not acceptable.
- J. 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 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.
- K. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- L. 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 09900.
- M. Do not penetrate building structural members unless indicated.
- N. Provide sleeves when penetrating walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- O. 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.
- P. Provide drain valves at main shut-off valves, low points of piping and apparatus.

### **3.3 CLEANING AND PROTECTION**

- A. All pipe, pipe fittings and appurtenances shall be free of rust and stains prior to substantial completion.

### **3.4 FINISHING EQUIPMENT AND MATERIAL**

- A. Use paint systems specified in Division 9 for the substrates to be finished.
- B. Paint all exposed pipes, unless otherwise indicated.
- C. All ferrous fasteners and hanger supports not having a corrosion resistant plated finish shall be painted to prevent rust.

**END OF SECTION**

**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Wet Type Sprinkler System
- B. System design, installation, and certification.

**1.2 RELATED REQUIREMENTS**

- A. Section 13910 - Fire Protection Basic Materials and Methods: Pipe, fittings, and valves.

**1.3 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; 2002.
- C. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

**1.4 SUBMITTALS**

- A. See Section 15010 - General Mechanical 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, product data, and hydraulic calculations to Fire Marshall for approval and to Architect for review. Submit to Architect prior to submitting to Fire Marshal. Submit proof of approval to the Architect.
- D. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations. Provide two (2) CD and three (3) paper copies of as-built drawings. CD's shall be in Autocad release 14 or later or in microstation V8 format.
- E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements. All certificates shall be signed by certificate holder.
- 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.

**1.5 QUALITY ASSURANCE**

- A. Maintain one copy of referenced design and installation standard on site.
- B. Conform to UL requirements.

**1.6 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.
- B. Store piping off floor and out of elements. Provide cover for piping to prevent dirt and debris from entering piping. Piping and fittings shall be rust free when installed.

### 1.7 EXTRA MATERIALS

- A. Provide extra sprinklers of type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
- B. Provide suitable wrenches for each sprinkler type.
- C. Provide metal storage cabinet located at piping entrance to building.

## PART 2 PRODUCTS

### 2.1 SPRINKLER SYSTEM

- A. Sprinkler System: Provide coverage for entire building.
- B. Occupancy: Light hazard; comply with NFPA 13.
- C. Water Supply: Contractor shall perform or have performed an NFPA-13 water flow test and a 24 hour static pressure test. Adjust flow test to lowest pressure recorded by 24 hour test of one hour duration.

### 2.2 SPRINKLERS

- A. Tyco and affiliates, Automatic Sprinkler, Reliable, Viking.
- B. All sprinklers installed shall be by the same manufacturer.
- C. Contractor shall select temperature ratings in accordance with NFPA 13.
- D. Extended coverage sprinklers shall NOT be used except where shown on contract drawings.
- E. Suspended Ceiling Type: Standard pendant type with matching flush push on two piece escutcheon plate.
  - 1. Finish: Chrome plated.
  - 2. Escutcheon Plate Finish: Chrome plated.
  - 3. Fusible Link: Quick response Glass bulb type temperature rated for specific area hazard.
  - 4. Orifice: 1/2".
- F. Gypsum Board Ceiling Type: Concealed pendant type with matching screw on escutcheon plate.
  - 1. Finish: Enamel, color off white.
  - 2. Escutcheon Plate Finish: Chrome plated.
  - 3. Orifice: 1/2".
- G. Extended coverage sprinklers, except where shown on contract drawings, shall not be used.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard and these specifications.

- B. Install sprinklers where shown on contract drawings. Sprinklers in gypsum board ceilings shall be in line with and centered between down lights unless shown otherwise.
- C. Place pipe runs to minimize obstruction to other work.
- D. Place piping in concealed spaces above finished ceilings.
- E. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- F. 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.
- G. Flush entire piping system of foreign matter.
- H. Hydrostatically test entire system.
- I. Require test be witnessed by Fire Marshall, Architect or his designated representative.
- J. All drain piping shall discharge to the outside 6" maximum above grade unless noted otherwise.
- K. Where sprinklers are required under oval or round duct, the centerline of the sprinkler shall be under the centerline of the duct.
- L. Where sprinklers are required under rectangular duct, the centerline of the sprinkler shall be minimum 6" under duct.

**END OF SECTION**