

SECTION 21 05 03 PIPES AND TUBES FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Pipe and pipe fittings for the following systems:
 - 1. Fire Suppression water piping within 5 feet of building.
 - 2. Pipe joints and fittings.
- B. Related Sections:
 - 1. Division 08 - Access Doors and Frames: Product requirements for access doors for placement by this section.
 - 2. Division 09 - Painting and Coating: Product and execution requirements for painting specified by this section.
 - 3. Section 21 05 04 - Valves for Fire Suppression: Product requirements for valves for placement by this section.
 - 4. Section 21 05 05 - Hangers and Supports for Fire-Suppression Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.
 - 5. Section 21 05 16 - Expansion Fittings and Loops for Fire-Suppression Piping: Product requirements for piping expansion compensation devices for placement by this section.
 - 6. Section 21 05 48 - Noise and Vibration Controls for Fire Suppression Piping and Equipment: Product requirements for vibration isolation for placement by this section.
 - 7. Section 21 12 00 - Fire Suppression Standpipes: Product requirements for fire standpipe piping for placement by this section.
 - 8. Section 21 13 13 - Wet-Pipe Sprinkler Systems: Product requirements for wet sprinkler piping for placement by this section.

1.02 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
 - 2. ASME B16.4 - Gray Iron Threaded Fittings.
 - 3. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - 4. ASME B31.9 - Building Services Piping.

5. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
 6. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.
- B. ASTM International:
1. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
 2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 3. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
 4. ASTM A536 - Standard Specification for Ductile Iron Castings.
- C. American Welding Society:
1. AWS D1.1 - Structural Welding Code - Steel.

1.03 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, and sizes.
- C. Product Data: Submit data on pipe materials and fittings. Submit manufacturers catalog information.
- D. Design Data: Indicate pipe sizes. Indicate pipe sizing methods. Indicate calculations used.
- E. Welders' Certificate: Include welders' certification of compliance with ASME Section IX.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- B. Perform Work in accordance with IBC-NJ.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five (5) years documented experience approved by manufacturer.
- C. Design pipe hangers and supports under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State of New Jersey.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Division 01 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not install underground piping when bedding is wet or frozen.

1.08 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.09 COORDINATION

- A. Division 01 - Administrative Requirements: Requirements for coordination.
- B. Coordinate installation of buried piping with trenching.

PART 2 - PRODUCTS

2.01 BLACK STEEL PIPE (SCHEDULE 40) SPRINKLER PIPE

- A. Pipe:
 - 1. Standard weight black steel pipe, Schedule 40, welded or seamless, with manufacturer's name rolled into each length.
- B. Fittings:
 - 1. Threaded: Standard malleable iron couplings with flat band. Red or white lead and oil or approved compound.
 - 2. Welded or Flanged: Standard weight steel.
 - 3. Mechanical Couplings: Victaulic Style 07, rolled groove.
- C. Application:
 - 1. Threaded: All wet pipe sprinkler systems, 2 inches in size and below.
 - 2. Mechanical: All wet pipe sprinkler systems, 2 -1/2 inches in size and above.

3. Welded: All fire standpipe over 175 PSIG.

2.02 GALVANIZED STEEL PIPE (SCHEDULE 40)

- A. Pipe:
 1. Standard weight galvanized steel pipe, Schedule 40, with makers name rolled into each length.
- B. Fittings:
 1. Threaded: Galvanized malleable iron with flat band pattern.
 2. Mechanical Couplings: Victaulic Style 07, rolled groove.
- C. Joints: Red or white lead and oil or approved compound.
- D. Application: Auxiliary drain piping and other piping systems subject to periodic wetting and drying.

2.03 BLACK STEEL PIPE (SCHEDULE 40) FIRE STANDPIPE

- A. Pipe:
 1. Standard weight black steel pipe, Schedule 40, welded or seamless, with manufacturer's name rolled into each length. Schedule 10 piping is not acceptable.
- B. Fittings:
 1. Threaded: Standard malleable iron couplings with flat band.
 2. Welded or Flanged: Schedule 40 steel.
 3. Mechanical Couplings: Victaulic Style 77, rolled groove.
- C. Joints: Red or white lead and oil or approved compound.
- D. Application:
 1. Threaded: All standpipe systems.
 2. Mechanical: All standpipe systems, 2-1/2 inches in size and above.
 3. Welded: All fire standpipe over 175 PSIG.

2.04 ACCEPTABLE MANUFACTURERS

- A. Mechanical Couplings:
 1. Victaulic

2. Tyco
 3. Grinnell
- B. Piping:
1. Allied Tube and Conduit Corp.
 2. Berger Pipe Co.
 3. Wheatland Tube Co.
- C. Fittings:
1. Flagg
 2. Nibco
 3. Stockham
 4. Victaulic

2.05 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
1. Ferrous Piping: Class 250, malleable iron, threaded.
 2. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- B. Flanges for Pipe 2-1/2 inches and Larger:
1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
 2. Gaskets: 1/16 inch thick preformed neoprene gaskets.
 3. Flanges shall be of same weight as the fittings and valves in each service category. Welding neck flanges shall be used with flanged valves and equipment on welded lines. Galvanized screwed flanges shall be used on galvanized screwed lines. Flanges shall be drilled in conformance with 150 lbs. or 300 lbs. standard and shall be faced and spot-faced. Threaded and loose flanges on brass piping shall be brass. Laps shall be machined on front, back and edge. Threaded flanges shall have faces perpendicular to adjoining pipe.

2.06 PIPE FITTINGS

- A. Each pipe fitting shall have cast, stamped, or indelibly marked on it the marker's name or mark, weight, and quality of the product when such marking is required by the approved standard.

- B. Welding fittings shall be of same material and schedule as pipe to which they are welded. Welding fittings including laterals shall be approved factory reinforced to develop full working pressure of connecting piping main. Welding elbows shall be long radius pattern. Welding fittings shall be used exclusively, except as otherwise specified. Weldolets may be used for branches only where branch is two (2) or more nominal pipe sizes smaller than main or riser. All welding "lateral" fittings shall have pressure ratings equal to the pipe with which they are to be used. Welding fittings shall be of Tube-Turn or Walworth manufacture or approved equal, to conform to ASTM-A-234 specifications.
- C. Nipples shall be extra heavy shoulder type of same material as pipe, close nipples are not acceptable.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Division 01 - Administrative Requirements: Verification of existing conditions before starting work.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. Route pipe in straight line.
- F. Install pipe to allow for expansion and contraction without stressing pipe or joints.

3.03 INSTALLATION - ABOVE GROUND PIPING

- A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors. Refer to Section 22 05 29.

- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 21 05 16.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 07 00.
- G. Provide access where valves and fittings are not accessible. Coordinate size and location of access doors with Division 08.
- H. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- I. Establish invert elevations, slopes and for drainage. Maintain gradients.
- J. Slope piping and arrange systems to drain at low points.
- K. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- L. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- M. Install valves in accordance with Section 21 05 04.
- N. Install pipe identification in accordance with Section 22 05 53.
- O. Insulate piping. Refer to Section 22 07 00.
- P. Install piping specialties in accordance with Section 23 21 16.

3.04 FIELD QUALITY CONTROL

- A. Division 01 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Fire standpipe and fire sprinkler systems shall be tested in accordance with NFPA-13 and NFPA-14.

3.05 CLEANING

- A. Division 01 - Execution and Closeout Requirements: Requirements for cleaning.

END OF SECTION