

SECTION 21 1100

FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

PART 1 GENERAL

1.01. SECTION INCLUDES

- A. Water pipe.
- B. Valves.
- C. Accessories.

1.02. REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.03. ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of new drainage piping with size, location and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.04. SUBMITTALS

- A. Product Data:
 - 1. Include data on pipe materials, pipe fittings, valves, and accessories.
 - 2. Provide manufacturer's catalog information.
 - 3. Indicate valve data and ratings.
 - 4. Show grooved joint couplings, fittings, valves, and specialties on drawings and product submittals, specifically identified with the manufacturer's style or series designation.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Field Quality Control Submittals: Testing activities.
- D. Project Record Documents:
 - 1. Record actual locations of piping and valves installed.
- E. Maintenance Data: Include installation instructions, spare parts lists, and exploded assembly views.

1.05. QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented.
- C. Provide grooved joint couplings, fittings, valves, specialties, and grooving tools from a

single manufacturer.

- D. Date stamp castings used for coupling housings, fittings, and valve bodies for quality assurance and traceability.
- E. Valves: Bearing product listing label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- F. Products:
 - 1. Listed, classified, and labeled as suitable for the purpose specified and indicated.
 - 2. Refer to FM (AG) - FM Approval Guide and UL (DIR).
- G. Perform Work in accordance with local authorities having jurisdiction; municipality; and water utility requirements.

1.06. DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- 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.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.07. WARRANTY

- A. Correct defective Work within a five-year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01. WATER PIPE

- A. Steel Pipe and Fittings:
 - 1. Pipe: Standard weight, zinc-coated, listed, ASTM A53/A53M.
 - 2. Fittings: Comply with applicable standard.
 - 3. Mechanically Factory Applied Protective Materials:
 - a. Clean by wire brushing and solvent cleaning.
 - b. Protect threaded pipe ends and fittings prior to coating.

2.02. VALVES

- A. Valves: Manufacturer's name and pressure rating marked on valve body.

PART 3 EXECUTION

3.01. PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.02. INSTALLATION

- A. General Requirements:
 - 1. Steel Piping:
 - a. Jointing:

- 1) Bell-and-Spigot: Make rubber-gasketed, bell-and-spigot joints with the gaskets previously specified for this type of joint, using an approved lubricant, all in accordance with the pipe manufacturer's recommendations.
 - 2) Welded: Make welded joints in accordance with AWWA C206 and install in accordance with AWWA M11.
 - 3) Sleeve-Type Mechanical Coupling: Assemble sleeve-type mechanical coupling joints in accordance with the coupling manufacturer's recommendations.
 - 4) Flanged:
 - (a) Make flanged joints up tight; avoid undue strain on flanges, fittings, valves, and other accessories.
 - (b) Align bolt holes for each flanged joint.
 - (c) Use full-size bolts for the bolt holes; use of undersized bolts due to misalignment of bolt holes or for any other purpose will not be allowed.
 - (d) Do not allow adjoining flange faces to be out of parallel to such a degree that the flanged joint cannot be made water-tight without straining the flange.
 - (e) When flanged pipe or fitting has dimensions that do not allow the making of a proper flanged joint as specified, replace it with one of correct dimensions.
 - 5) Grooved:
 - (a) Make grooved type joints with the couplings specified for this type joint connecting pipe with roll-grooved ends or pipe with welded-on cut-grooved adapters, each with dimensions as previously specified for this type of joint.
 - (b) Groove pipe ends in the field only with approved groove rolling equipment and groove adapters in the field only with approved groove cutting equipment; use only groove rolling and groove cutting equipment designed especially for the purpose and produced by a manufacturer of grooved joint couplings.
 - (c) Obtain approval for field-cut grooves prior to assembling the joint.
 - 6) Shouldered: Make shouldered type joints with the couplings specified for this type joint connecting pipe with the shouldered ends specified for this type of joint.
 - 7) Assemble grooved and shouldered type joints in accordance with the recommendations of the coupling manufacturer.
 - 8) Insulating:
 - (a) Make insulating joints with the gaskets, sleeves, washers, bolts, and nuts specified for this type joint.
 - (b) Assemble insulating joints as specified for flanged joints, except that bolts with insulating sleeves be full size for the bolt holes.
 - (c) Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.
- b. Allowable Offsets:

- 1) For pipe with bell-and-spigot rubber-gasket joints, 5 degrees maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets; unless a lesser amount is recommended by the manufacturer.
- 2) Form short-radius curves and closures by short lengths of pipe or fabricated specials specified.

3.03. FIELD QUALITY CONTROL

A. Field Tests and Inspections:

1. Provide all labor, equipment, and incidentals required for field testing, except that water and electric power needed for field tests.
2. Prior to hydrostatic testing, obtain approval from Architect for proposed method for disposal of wastewater from hydrostatic testing.
3. The Architect will conduct field inspections and witness field tests as specified in this Section.
4. Fill pipeline 24 hours before testing and apply test pressure to stabilize system.
5. Test water piping in accordance with NFPA 13, where the additional water added to the system must not exceed the limits given in NFPA 13.
6. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
7. Prepare reports of testing activities.

3.04. CLEANING

- #### **A. Upon completion of the installation of water lines and appurtenances, remove and haul away all surplus material, including debris resulting from the work.**

3.05. CLOSEOUT ACTIVITIES

- #### **A. Demonstrate proper operation of equipment to Owner's designated representative.**
- #### **B. Demonstration: Demonstrate operation of system to Owner's personnel.**
1. Use operation and maintenance data as reference during demonstration.
 2. Conduct walking tour of project.
 3. Briefly describe function, operation, and maintenance of each component.
 4. Training: Train Owner's personnel on operation and maintenance of system.
 5. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.