

SECTION 15062
DUCTILE IRON PIPE

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of furnishing and installing ductile iron pipe and fittings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02221: Utility Trenching and Backfilling
- C. Section 02223: Trenching, Backfilling and Compaction
- D. Section 15010: General Process and Onsite Utility Piping Provisions
- E. Section 15080: Piping Accessories & Appurtenances
- F. Section 15094: Hangers and Supports
- G. Section 15097: Seismic Restraints for Piping
- H. Section 15100: Valves

1.03 QUALITY ASSURANCE

References, American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), Federal Specifications (FS), and the manufacturer's printed recommendations.

1.04 SUBMITTALS

- A. In accordance with Section 01300.
- B. Materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.

1.05 PRODUCT HANDLING

Handle pipe and fittings in a manner to insure delivery in a sound undamaged condition.

PART 2: MATERIALS

2.01 DUCTILE IRON PIPE

- A. Pipe shall conform to ANSI A21.50 (AWWA C115), ANSI A21.51 (AWWA C151), and A21.4 (AWWA C104) as appropriate.
- B. Flanged pipe shall be per ANSI A21.15 (AWWA C115) pressure class:
- | | |
|---------------|-----------|
| 3 – 12-inches | Class 350 |
| > 12-inches | Class 250 |
- C. Pipe wall thickness for grooved couplings shall be Class 54.
- D. Pipe wall thickness for push-on joint and mechanical joint pipe shall be Pressure Class 350 psi for pipe 12-inches and smaller, and Pressure Class 250 psi for larger pipe.
- E. Pipe shall have Protecto 401, Perma Shield 431, or equal lining for raw sewage service and bituminous coated mortar lining for all other service.
- F. Buried pipe shall have bituminous coating per ANSI A21.4. Exposed (painted) pipe shall have prime coat compatible with finish coating specified in Section 9900. All exposed pipe with bituminous coating must be sand blasted to remove the bituminous material as required for specified coating system.
- G. Standard pipe laying lengths shall be eighteen (18) or twenty (20) feet.

2.02 FITTINGS AND SPECIALS (EXCEPT GROOVED)

- A. Cast iron and ductile iron specials and fittings shall conform to ANSI A21.10 (AWWA C110) or ANSI 21.53 (AWWA C153) with joints as shown on the Drawings or as required elsewhere in these Specifications or for the installation. Buried fittings shall have an asphaltic outside coating in accordance with ANSI/AWWA C153/A21.53, except as otherwise noted herein.
- B. Interior lining of specials and fittings shall match the adjoining specified pipe lining, except as otherwise noted herein. All standard fittings for raw sewage or sludge service shall be lined with Protecto 401, Perma Shield 431, or equal ~~PROTECTO 401 lined~~. Coatings shall be bituminous, if buried; or as specified in Section 9900.

2.03 FLANGES

- A. ANSI B16.1, CLASS 125 unless otherwise indicated, or required for the installation.
- B. Flanges for spool pieces shall be factory installed threaded flanges. Flanges for fittings shall be cast integrally with the fitting.

2.04 RESTRAINED MECHANICAL JOINTS

Where specified, called for on the Drawings, or otherwise required for thrust restraint, mechanical joints shall be made using retainer glands with set screws or clamping lugs. Retainer glands shall be as manufactured by EBAA Iron; Tyler Pipe, or equal. Anti-corrosion coatings are required and shall be Mega-Bond, Tuf-Bond, or equal.

2.05 RESTRAINED PUSH-ON JOINTS

Where specified, called for on the drawings, or otherwise required for thrust restraint, push-on joints shall be Flex-Ring as manufacturer by American Ductile Iron Pipe, TR Flex as manufactured by US Pipe, or equal. Restrained joint shall provide for joint deflection after assembly.

2.06 RUBBER GASKET FOR MECHANICAL OR PUSH-ON JOINT

ANSI A21.11 (AWWA C111), vulcanized natural or vulcanized synthetic rubber.

2.07 FLANGED GASKETS

Full face, 1/16-inch thick cloth inserted neoprene or metallic packing.

2.08 BOLTS & NUTS FOR FLANGES, FITTINGS, and RESTRAINTS

ANSI B18.2.1 and B18.2.2, low alloy, high strength, zinc coated when exposed, Xylan "Blue bolt" or 316 stainless steel when buried, and 316 stainless steel submerged or below top of wall in water bearing structures.

2.09 GROOVED FITTINGS

Cast iron, ASTM A-48, Class 30-A, cement lined. Victaulic, Gustin-Bacon, or equal.

2.10 POLYETHYLENE ENCASEMENT

Buried piping, specials, and fittings shall be polyethylene encased, double wrapped - 8 mils thickness, sized to pipe diameter, ANSI/AWWA-C105/A21.5. Polyethylene shall be black, low density film.

2.11 PROTECTO 401 OR EQUAL

- A. Where specified Protecto 401, Perma Shield 431, or equal shall be applied as indicated by the published specifications of the coating manufacturer.

PART 3: EXECUTION

3.01 INSTALLATION

A. General

1. Pipe shall be laid in accordance with the pipe manufacturer's published instructions, Standard Drawings, and ANSI/AWWA C600, as complimented and modified herein.

- a. Cleanliness: The interior of the pipes shall be clean of foreign materials before the sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.
- b. Allowable Deflection: The maximum allowable angular deflection at the joints shall be 80% of the manufacturer's recommendation for push-on and mechanical joints.

- B. Bell and Spigot Ductile Iron Pipe. Where bell and spigot joints are used for joining ductile iron pipe, the joints shall be made using rubber rings, US "Tyton", Clow "Super Bell-Tite" joint, or equal. Gasket seat, gasket, and spigot shall be thoroughly cleaned before assembly of joint. The entire procedure shall be in strict accordance with manufacturer's recommendations.

- C. Mechanical Joint Ductile Iron Pipe. Mechanical joints in ductile iron pipe shall be made as follows: Gland shall be placed on spigot end of pipe with lip extension toward the joint. The rubber gasket shall then be slipped on the pipe with its thick edge toward the gland. The gasket and joint surfaces shall then be thoroughly wetted using a soapy solution made with vegetable soap or similar soap as recommended by the manufacturer. The spigot end of the pipe shall then be inserted to full depth of the mechanical joint socket and the gasket pressed firmly into place in the bell in order to obtain an even "set" all around the joint. The gland shall then be moved into place, the bolts inserted and the nuts taken up tightly with fingers. The nuts shall then be tightened gradually by wrench -- a half turn at a time, moving wrench from one nut to another repeating until all nuts are uniformly tight. Final tightness shall be with a torque wrench as follows: three-quarter inch bolts - 60 to 90 pounds torque.

- D. Flanged Pipe. Flanged joints shall be made up square, with even pressure on the

gaskets, and shall be watertight.

E. Grooved Coupling: Grooved couplings shall be prepared or painted as necessary to obtain a leak-free seal.

F. Polyethylene Encasement for External Corrosion Protection for Buried Piping:

1. General: Provide polyethylene encasement for all buried Ductile Iron Pipe.

2. Installation on Pipe:

- a. Pick up the pipe with a sling or pipe tongs. Slip a polyethylene tube which is approximately two feet longer than the pipe over the plain end and leave it bunched up accordion style.
- b. Lower the pipe into the trench and make up the joint with the preceding pipe. Shallow bell holes are required to allow overlap of the tube at the joints.
- c. Remove the sling or tong from the center of the pipe, raise the bell a few inches and slip the polyethylene tube along the pipe barrel, leaving approximately one foot of the tube bunched up at each end of the pipe for wrapping the joints.
- d. Overlap each joint by first pulling one bunched-up tube over the bell, folding it around the adjacent plain end, and securing it in place with two or three wraps of the polyethylene adhesive tape. Complete the overlap by repeating the same procedure with the bunched-up tube on the adjacent pipe.
- e. Take up the slack tube along the pipe barrel by folding it over the top of the pipe holding the fold in place with polyethylene adhesive tape.
- f. Repair any rips, punctures or other damage to the polyethylene with tape or by cutting open a short length of tube, wrapping it around the pipe and securing with tape.

3. Installation on Fittings, Valves and Piping Specialties:

- a. Fit bends, reducers and offsets with polyethylene tube in the same manner described above for pipe.
- b. Wrap valves, tees, crosses and specialty items with a flat sheet obtained by splitting open a length of polyethylene tube. Pass the

sheet under the valve or fitting and bring it up around the body. Join the seams by bringing the edges together, folding over twice and securing in place with tape.

- c. Handle slack tube and overlapping at joints in the same manner described above for pipe.
- d. Prepare openings for service taps, air reliefs, etc., by making an X-shaped cut in the polyethylene and temporarily folding back the edges. After installation is completed, replace the polyethylene and repair the cut with polyethylene adhesive tape.

4. Backfilling

- a. Care shall be taken not to damage the polyethylene.
- b. Initial backfill material shall be free of rocks and debris which could puncture the polyethylene. If suitable backfill material is not available, felt roofing or similar material can be laid over the top of the pipe to protect the polyethylene.
- c. In general, backfilling shall be done in accordance with AWWA Standard C-600.

END OF SECTION