

SECTION 15062DUCTILE IRON PIPE & FITTINGSPART 1 - GENERAL1.1 DESCRIPTION

- A. Work Included: Provide and install ductile iron pipe and fittings of the type(s) and size(s) in the location(s) shown on the Drawings and as specified herein.
- B. Related Work Specified Elsewhere:
 - 1. Pipe and Pipe Fittings - General is specified in Section 15050.
 - 2. Surface Preparation and Shop Coatings are specified in Section 09905.

1.2 QUALITY ASSURANCE

- A. Standards (As Applicable):
 - 1. Cement-mortar lining for water: ANSI A21.4 (AWWA C104).
 - 2. Rubber gasket joints: ANSI A21.11 (AWWA C111).
 - 3. Ductile iron pipe thickness: ANSI A21.50 (AWWA C150).
 - 4. Ductile iron pipe centrifugally cast in metal or sand lined molds: ANSI A21.51 (AWWA C151).
 - 5. Pipe flanges and fittings: ANSI B16.1 and ANSI A21.10 (AWWA C110).
 - 6. Threaded, flanged pipe: ANSI A21.15 (AWWA C115).
 - 7. Cast and ductile iron fittings: ANSI A21.10 (AWWA C110).
- B. Acceptable Manufacturers:
 - 1. Tyler
 - 2. Griffin
 - 3. Union
 - 4. US Pipe
 - 5. Or equivalent.

1.3 DELIVERY, STORAGE & HANDLING

- A. Exercise extra care when handling cement lined pipe because damage to the lining will render it unfit for use.
- B. Protect the spherical spigot ends and the plain ends of all pipe during shipment by wood lagging securely fastened in place.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

A. General:

1. Unless otherwise shown on the Drawings, the minimum thickness of ductile iron pipe shall be Class 53.
2. Pipe for use with sleeve type couplings shall have plain ends (without bells or beads) cast or machined at right angles to the axis.
3. Pipe shall be double thickness cement lined and seal coated unless noted otherwise on the Drawings and except for air piping lines which shall be completely unlined.
4. Pipe for use with split type couplings shall have ends with cast or machined shoulders or grooves that meet the requirements of the manufacturer of the couplings.
5. The outside of all interior pipe shall be coated in accordance with Section 15050.

B. Joints (as shown on Drawings or as specified):

1. Flanged:

- a. Provide specially drilled flanges when required for connection to existing piping or special equipment.
- b. Flanges shall be flat face, long-hub screwed tightly on pipe by machine at the foundry prior to facing and drilling.
- c. Gaskets:
 - (1) Full face gaskets only.
 - (2) Thickness of gaskets 12 inches in diameter and smaller: 1/16 inch.
 - (3) Thickness of gaskets larger than 12 inches in diameter: 3/32 inch.
 - (4) On high temperature applications such as air lines, the gaskets shall be suitable for service from 40°F to 250°F.
- d. Fasteners:
 - (1) Make joints with bolt, studs with a nut on each end, or one tapped flanged with a stud and nut.
 - (2) The number and size of bolts shall meet the requirements of the applicable ANSI standard.
 - (3) Nuts, bolts, and studs shall be Grade B meeting the requirements of ASTM A307.
- e. When applicable, provide and install flange clamps as shown on the Drawings.

2. Grooved split ring couplings, sleeve couplings, flexible joints and couplings, shall be supplied as specified in "Couplings and Connectors" Section.

3. Joint Bracing:

- a. Provide joint bracing to prevent the piping from pulling apart under pressure as required and as shown on the Drawings.

- b. Types of bracing:
 - (1) Pipe and fittings furnished with approved lugs or hooks cast integrally for use with socket pipe clamps, tie rods, or bridles. Bridles and tie rods shall be a minimum of 3/4 inch diameter except where they replace flange bolts of a smaller size, in which case they shall be fitted with a nut on each side of the pair of flanges. The clamps, tie rods, and bridles shall be coated with bituminous paint in buried installations and shall be coated with the same coatings as the piping system in interior installations after assembly or, if necessary, prior to assembly.
 - (2) Other types of bracing as shown on the Drawings.

2.2 FITTINGS

A. Standard Fittings:

- 1. Either gray cast iron or ductile iron fittings may be furnished.
- 2. Pressure rating of 250 psi unless indicated otherwise on the Drawings or as specified.
- 3. Flange fittings shall be ANSI B16.1, Class 125 unless indicated otherwise. Flanges shall be flat faced, with full face gaskets.
- 4. Joints the same as the pipe with which they are used or as shown on the Drawings.
- 5. Provide fittings with standard bases where shown on the Drawings.
- 6. Cement lining and seal coat unless noted otherwise on the Drawings, and except for air piping applications where the fittings shall be unlined.
- 7. All interior fittings shall receive coating in accordance with Section 15050.
- 8. On high temperature applications such as air lines, the gaskets shall be suitable for service from 40°F. to 250° F.

B. Non-Standard Fittings:

- 1. Fittings having non-standard dimensions shall be subject to the Engineer's review and acceptance.
- 2. Non-standard fittings shall have the same diameter and thickness as standard fittings and shall meet the specification requirements for standard fittings.
- 3. The lengths and types of joints shall be determined by the particular piping to which they connect.
- 4. Flanged fittings not meeting the requirements of ANSI A21.10 (i.e., laterals or reducing elbows) shall meet the requirements of ANSI B16.1 in Class 125.

C. Wall Castings:

- 1. Size, type and location as shown on the Drawings.
- 2. Dimensions shall conform to ANSI A21.10 except where required. A flange substantially flush with the face of a concrete or masonry wall shall be drilled and tapped for studs.
- 3. Other dimensions shall be identical to the corresponding parts of standard bell and spigot fittings.

4. A central fin not less than 1/2 inch thick and of the same diameter as a flange shall be cast on the barrel at a point that will locate it midway through the wall to form a waterstop.
5. Alternate wall sleeve system as manufactured by Omni Sleeve, Malden, MA. can be utilized as approved by Engineer, in place of above specified wall casting system.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Provide all labor necessary to assist the Engineer to inspect pipe, fittings, gaskets, and other materials.
- B. Carefully inspect all materials at the time of delivery and just prior to installation.
- C. Carefully inspect all pipe and fittings for:
 1. Defects, such as weak structural components, that adversely affect the execution and quality of work.
 2. Deviations beyond allowable tolerances for pipe clearances.
- D. Immediately remove all rejected materials from the project site.

3.2 INSTALLATION

- A. General:
 1. Install in strict accordance with the pipe and fitting manufacturer's instructions and recommendations and as specified or as shown on the Drawings.
 2. Acceptable thrust resistant system is required at all fittings on pressure pipe.
- B. Assembling Joints:
 1. Flanged Joints:
 - a. Insert the nuts and bolts (or studs), finger tighten, and progressively tighten diametrically opposite bolts uniformly around the flange to the proper tension.
 - b. Execute care when tightening joints to prevent undue strain upon valves, pumps, and other equipment.
 2. Bolted Joints:
 - a. Remove rust preventive coatings from machined surfaces prior to assembly.
 - b. Thoroughly clean and carefully smooth all burrs and other defects from pipe ends, sockets, sleeves, housings and gaskets.
- C. Fabrication:
 1. Tapped Connections:
 - a. Make all tapped connections as shown on the Drawings or as required by the Engineer.
 - b. Make all connections watertight and of adequate strength to prevent pullout.
 - c. Drill and tap normal to the longitudinal axis of the pipe.

- d. The maximum sizes of taps in pipes and fittings without busses shall not exceed the sizes listed in the appendix of ANSI A21.51 based on 3 full threads for ductile iron.
 - e. Taps in fittings shall be located where indicated by the manufacturer for that particular type of fitting.
- D. Castings in Masonry:
- 1. Accurately set and align castings to be encased in masonry.
 - 2. Thoroughly clean castings immediately prior to being set in place. Remove all rust, scale and other foreign material.

END OF SECTION