DELAWARE CONSTRUCTION SPECIFICATION

DUCTILE-IRON PIPE CONDUITS CS 45

1. **SCOPE**

The work shall consist of furnishing and installing ductile iron pipe, fittings, and appurtenances as shown on the drawings.

2. **MATERIALS**

Ductile-iron pipe and fittings shall conform to the requirements of Material Specification 209. Thickness class of pipe and rated working pressure shall be as specified on the drawings.

Unless otherwise specified, special fittings and appurtenances shall be the same material as the pipe.

3. **LAYING AND BACKFILLING THE PIPE**

Pipe shall be laid to the line and grade shown on the drawings with bell socket ends pointing upstream unless otherwise specified. The pipe shall be installed in accordance with the manufacturer's recommendations, unless otherwise specified. Two copies of the pipe manufacturer's installation instructions shall be provided to the Engineer prior to placement of any pipe. Bell holes for flanged, push-on, or mechanical joint pipe shall be provided as necessary to allow space for joint assembly and to permit the pipe barrel to be uniformly supported by the backfill.

Backfill shall be placed and compacted in accordance with Delaware Construction Specification 15 – STRUCTURAL BACKFILL. The pipe shall be loaded sufficiently during backfilling around the sides to prevent its being lifted from the bedding.

4. **JOINTS AND CONNECTIONS**

Pipe joints shall conform to the details shown on the drawings and shall be sound and watertight at the pressures specified on the drawings.

Pipe shall be joined in accordance with the manufacturer's recommendation, except as otherwise specified on the drawings.

5. HANDLING THE PIPE

The Contractor shall furnish such equipment and facilities as are necessary to handle, store, and place the pipe without damaging the pipe, lining or coating. Pipe coating or lining that is damaged shall be repaired by methods recommended by the manufacturer unless otherwise specified on the drawings.

6. PRESSURE TESTING

Pressure testing of the conduit, when specified, shall be performed as follows:

a. Backfill shall be made only in sufficient amount to hold the conduit in place during testing, with the following exceptions:

   i. Compacted backfill shall be placed to its final depth as shown on the drawings at vertical and horizontal angle points, road crossings, and thrust blocks. Backfill shall be placed in such a way that the conduit and joints will not be subject to displacement or damage.

   ii. All joints and connections shall be completely exposed for visual observation during testing.

b. Before pressure testing, the pipeline shall be flushed and cleaned.

c. The pipeline shall not be pressure tested until concrete in the anchor and thrust blocks has attained the minimum specified compressive strength or other specified methods of thrust restraint provided.

d. The total conduit or section of the conduit to be tested shall be filled with clean water at the rate specified and tested at the pressure specified on the drawings.

e. The section of conduit being tested shall be allowed to stand full of water for a minimum of 24 hours before the start of pressure and leakage test. Test pressures shall be held constant for 2 hours. If the amount of water loss exceeds the limit specified on the drawings, the leaks shall be repaired and the conduit shall be retested. The procedure shall be repeated until the specifications are met.

7. **BACKFILL**

Backfill in accordance with the drawings shall be to its final depth as shown on the drawings for the section of conduit being tested.

The Contractor shall be fully responsible for any and all work required to repair any leakage when water loss exceeds the amount specified on the drawings.