

# Construction Specification 53—Ductile-Iron Pipe

## **1. Scope**

The work consists of furnishing and installing ductile-iron pipe, fittings, and appurtenances as specified in section 9 of this specification and as shown on the drawings.

## **2. Material**

Ductile-iron pipe and fittings shall conform to the requirements of Material Specification 553, Ductile-Iron Pipe. Thickness class of pipe and rated working pressure shall be as specified in section 9 of this specification or as shown on the drawings.

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

## **3. Laying and bedding the pipe**

Pipe shall be installed to the lines and grades shown on the drawings with bell socket ends aligned 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 before any pipe placement. The pipe shall be firmly and uniformly bedded within the trench throughout the entire length of the pipe section to the depth and in the manner specified. 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 on 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 in section 9 of this specification.

## **5. Handling the pipe**

The contractor shall furnish all equipment and facilities needed to handle, store, and place the pipe without damaging the pipe, lining, encasement, or coating. Pipe coating, encasement, or lining that is damaged shall be repaired using methods recommended by the manufacturer unless otherwise specified in section 9 of this specification.

## **6. Pressure testing**

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

- a. Placement of backfill before pressure testing shall be as specified in section 7 of this specification.
- b. Before pressure testing, the pipeline shall be flushed and free of all foreign material.
- c. The pipeline shall not be pressure tested until concrete for anchor and thrust blocks has attained the minimum specified compressive strength unless other specified methods of thrust restraint are provided.
- d. The total conduit or continuous section of conduit to be tested shall be filled with clean water at a rate not to exceed the maximum specified and tested at the pressure(s) specified in section 9 of this specification.
- 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 tests. Test pressures shall be held constant for 2 hours. When the amount of water loss exceeds the maximum allowable loss specified in section 9 of this specification, the leak(s) shall be repaired or otherwise corrected and the conduit shall be re-tested. The testing procedure shall be repeated until the requirements of the specifications are met.

## **7. Backfill**

**Method 1**—Backfill in accordance with section 9 of this specification shall be accomplished only in sufficient amount to hold the conduit in place during testing, with the following exceptions:

- a. Compacted backfill shall be placed to its final depth as shown on the drawings at vertical and horizontal deflection points, road crossings, and thrust blocks. Backfill shall be placed so that conduit and joint displacement does not occur.
- b. All joints and connections shall be completely exposed for visual observation during testing, except at locations described in the exception above.

**Method 2**—Backfill in accordance with section 9 of this specification shall be to the final depth as shown on the drawings for the section of conduit being tested.

**Use with either method**—The contractor shall be fully responsible for any and all work required to correct any leakage when the leakage test results in water loss that exceeds the amount specified in section 9 of this specification.

## **8. Measurement and payment**

For items of work for which specific unit prices are established in the contract, the quantity of each size, and thickness class of pipe is determined to the nearest foot by measurement of the installed length of pipe along the crown centerline of the conduit. Payment for each size and thickness class of pipe is made at the contract unit price for that size and thickness class of pipe. Such payment constitutes full compensation for furnishing, transporting, handling, and installing the pipe and necessary fittings and appurtenances complete in place.

Compensation for any item of work described in the contract, but not listed, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 9 of this specification.

## **9. Items of work and construction details**