

CONSTRUCTION SPECIFICATION

4I. REINFORCED CONCRETE PRESSURE PIPE CONDUITS

1. SCOPE

The work shall consist of furnishing and installing reinforced concrete pressure pipe conduits, fittings and accessories as shown on the drawings and/or specified herein.

2. MATERIALS

Reinforced concrete pressure pipe, fittings and accessories shall conform to the requirements of Material Specification 54I.

Portland cement concrete for bedding and cradles shall conform to the requirements of Construction Specification 3I for the specified class of concrete.

Joint sealing compound shall conform to the requirements of Material Specification 536.

Preformed expansion joint filler shall conform to the requirements of Material Specification 535.

Filter Fabric shall conform to Material Specification 592.

Portland Cement Concrete for Bedding and Cradles shall conform to Construction Specification 31.

3. LAYING THE PIPE

The pipe shall be set to the specified line and grade and temporarily supported on pre-cast concrete blocks or wedges. Concrete blocks and wedges used to temporarily support the pipe during placement of concrete bedding and/or cradle shall be of a class of concrete equal to or stronger than the concrete used to construct the bedding and/or cradle. Bell and spigot pipe shall be laid with the bells or grooves facing upstream unless otherwise specified in Section 7 or shown on the drawings. When pre-cast pipe risers and other similar pre-cast pipe structures are installed prior to pipe installation, pipe may be installed in the downstream direction with the belled end upstream. Adequate bell clearance in the subgrade/bedding shall be provided.

Just before each joint is connected the connecting surfaces of the bell and spigot or spigots and sleeve shall be thoroughly cleaned and dried, and the rubber gasket and the inside surface of the bell or sleeve shall be lubricated with a light film of soft vegetable soap compound (flax soap). The rubber gasket shall be stretched uniformly as it is placed in the spigot groove to insure a uniform volume of rubber around the circumference of the pipe.

Method 1 The joint shall be connected by means of a pulling or jacking force so applied to the pipe that the spigot enters squarely into the bell.

Method 2 The joint shall be connected in accordance with the manufacturer's instructions.

Use with Either Method When the spigot has been seated to within 1/2 inch of its final position, the position of the gasket in the joint shall be checked around the entire circumference of the pipe by means of a metal feeler gauge. In any case where the gasket is found to be displaced, the joint shall be disengaged and properly reconnected. After the position of the gasket has been checked, the spigot shall be completely pulled into the bell and the section of pipe shall be adjusted to line and grade.

4. FILLING JOINTS

Before the placement of the bedding or cradle, the exterior annular space between the ends of the pipe sections shall be cleaned and completely filled with joint sealing compound. Before the compound is applied, the surfaces against which it is to be placed shall be cleaned of all dust, lubricant and other substances that would interfere with a bond between the compound and the pipe. If recommended by the manufacturer of the compound, the concrete surfaces shall be coated with a primer in accordance with the manufacturer's recommendations. Primers shall be applied to the concrete surfaces only and shall not come in contact with the gasket or gasket sealing surfaces. Unless the compound or primer is specifically recommended for use on moist concrete, the surfaces shall be dry when it is applied.

The joint sealing compound shall be allowed to cure until it is sufficiently firm to prevent the entry of concrete or earth into the joint. Unless otherwise specified in Section 7 of this specification, prior to placing bedding or earth backfill (excluding concrete) containing particles larger than one-fourth inch in maximum dimension within 6 inches of the joint sealing compound, the compound shall be covered with a strip of 16-gage to 24-gage metal at least 2-inches wider than the space between the ends of the pipe sections. In lieu of metal strips, the joints shall be covered by a minimum of 2-foot wide, 4-ply thickness of filter fabric. Filter fabric shall be wrapped completely around the joint and overlapped a minimum of 12-inches at the top of the pipe. Lap shall be securely fastened to ensure filter fabric fits snugly during backfill operations. Filter fabric to be centered on the joint. Filter fabric shall conform to Material Specification 592, Table 2 Non-woven, Class II.

5. PRESSURE TESTING

Method 1 Pressure testing of the completed conduit will not be required.

Method 2 Prior to the placement of any concrete or earthfill around the conduit or filling of the pipe joints, the conduit shall be tested for leaks in the following manner: The ends of the conduits shall be plugged and a standpipe with a minimum diameter of two (2) inches shall be attached to the upstream plug. The conduit shall be braced at each end to prevent slippage. The conduit and the standpipe shall be filled with water. The water level in the standpipe shall be maintained a minimum of

10 feet above the invert of the upstream end of the conduit for a period of not less than two hours. Any leaks shall be repaired and the conduit shall be tested again as described above. The procedure shall be repeated until the conduit is watertight.

The pipe joints shall show no leakage. Damp spots developing on the surface of the pipe will not be considered as leakage.

Method 3 Prior to placement of any concrete or earthfill around the conduit or filling of the pipe joints, the conduit shall be air tested in accordance with ASTM C 924.

The conduit shall be braced on each end to prevent slippage. All end plugs used for the air test shall be capable of resisting the internal pressure and must be securely braced.

All testing equipment to be used shall be furnished by the Contractor and shall be inspected and approved by the Engineer. The pressure gauges used shall be graduated to read in increments of 0.1 psi and calibrated to provide accuracy within 10 percent plus or minus of the standard gauge. The Contractor has the option of pre-wetting the conduit or line prior to testing.

Any conduit that fails to pass this test must be repaired by a method satisfactory to the Engineer. After the repairs are made the conduit shall be re-tested until it passes the test requirements.

Method 4 Prior to the placement of concrete or earth backfill around the conduit joint to be tested or filling the pipe joints, the joint shall be tested in accordance to ASTM C 1103, *Standard Practice for Joint Acceptance Testing of Installed Pre-cast Concrete Sewer Line*. The test pressure shall specified in Section 7 of this specification. Any joints showing leaks shall be re-laid or repaired and the joint shall be re-tested. The procedure shall be repeated until the joint passes the test.

6. MEASUREMENT AND PAYMENT

Method 1 For items of work for which specific unit prices are established in the contract, the quantity of each size, type and class of pipe will be determined to the nearest 0.1 foot by measurement of the laid length of pipe along the invert centerline of the conduit. Payment for each size, type and class of reinforced concrete pressure pipe will be made at the contract unit price for that size, type and class of pipe. Such payment will constitute full compensation for furnishing, transporting and installing the pipe complete in place including accessories such as wall fittings, joint gaskets, coupling bands, sleeves or collars and all other items necessary and incidental to the completion of the work, except the special fittings and appurtenances listed separately in the bid schedule. Payment for each special fitting and appurtenance will be made at the contract price for that type and size of fitting or appurtenance.

Method 2 For items of work for which specific unit prices are established in the contract, the quantity of each size, type and class of pipe will be determined as the

sum of the nominal laying lengths of the pipe sections used. Payment for each size, type and class of reinforced concrete pressure pipe will be made at the contract unit price for that size, type and class of pipe. Such payment will constitute full compensation for furnishing, transporting and installing the pipe complete in place including accessories such as wall fittings, joint gaskets, coupling bands, sleeves or collars and all other items necessary and incidental to the completion of the work, except the special fittings and appurtenances listed separately in the bid schedule. Payment for each special fitting and appurtenance will be made at the contract price for that type and size of fitting and appurtenance.

All Methods The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be 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 7 of this specification.