

Special Specification 7001

Slip Lining Pipe or Box Culverts



1. DESCRIPTION

Rehabilitate existing pipe or box culverts by slip-lining with new pipe. Grout any voids between the host and insert pipe. Pipe diameters and shapes will be shown on the plans.

2. MATERIALS

Unless noted otherwise, provide an insert pipe of one of the following materials:

- 2.1. Polyvinyl Chloride (PVC). Furnish PVC pipe and fittings in accordance with Item 481, "Pipe for Drains."
- 2.2. High Density Polyethylene (HDPE) Pipe. Provide solid wall HDPE pipe and fittings meeting the requirements of ASTM F 714. Manufacture HDPE pipe and fittings from PE resin compounds, conforming to the requirements of cell class 345464C as defined and described in ASTM D 3350-05, with a maximum carbon black content of 2.5% and with a Slow Crack Growth of at least 100 hours as measured by the PENT test.

Provide mechanical end connectors, male and female. Provide pipe joints in compliance with ASTM D3212, Standard Specification for Joint Tightness.
- 2.3. Corrugated Metal Pipe. Provide corrugated metal pipe and fittings in accordance with Item 460, "Corrugated Metal Pipe."
- 2.4. Steel Pipe. Provide smooth carbon steel pipe conforming to ASTM A 139, Grade E. Provide round or shaped pipes having a diameter or least dimension of 48 in. or less with a wall thickness of 0.25 in. Provide round or shaped pipes greater than 48 in. in diameter or least dimension with a wall thickness of 0.5 in. Provide electrodes for butt-welded splices that are compatible with the steel pipe material. Butt weld field splices in accordance with AWWA C206.
- 2.5. Grout. For slip-lining of pipe culverts, provide grout conforming to Article 421.2.7. "Mortar and Grout." For slip-lining of box culverts using either round or arched pipes, provide flowable fill in accordance with Item 401, "Flowable Backfill."

3. CONSTRUCTION

- 3.1. Cleaning. Clean existing culvert pipes or boxes in accordance with Item 480, "Cleaning Existing Culverts." Remove all debris or obstructions that would prevent insertion of the new pipe.
- 3.2. Pipe Splicing. Make pipe connections in accordance with the pertinent Items for PVC or corrugated metal pipe. Butt-weld steel pipe in accordance with AWWA C206. Splice or connect HDPE sections with fittings as indicated above. Make or assemble splices and connections outside of the host pipe to allow for inspection before inserting the lining pipe. Insert new pipe sections into the host pipe or box without damaging the liner pipe.
- 3.3. Inserting Liner Pipe. Excavate suitable trenches for connecting and inserting pipe sections if the grade at the end of the host pipe is below the ground surface. Protect excavations deeper than 5 ft. as specified in Item 402, "Trench Excavation Protection" or Item 403, "Temporary Special Shoring." Support assembled sections of pipe as necessary to insure integrity of the connections while making the connections and inserting the pipe. Do not interfere with the operation of any street, highway, railroad, or other facility and do not weaken

any embankment or structure. Insert liner pipe in a manner that does not damage the liner or the host pipe or box culvert. Insure that the grade of the original host pipe or culvert is maintained.

- 3.4. Pipe Stockpiling and Handling. Stockpile pipe and fittings at staging areas or pit locations arranged to cause minimal interference with pedestrians and located outside the clear zone for vehicular traffic. Avoid damaging the liner pipe when assembling and inserting. Pipe with deep cuts, scratches, or gouges shall be rejected or replaced at no expense to the Department. Pipe found to have developed an irregular shape that will not allow pipe joining or insertion without the use of outside forces to bring pipe to round shape, will be rejected and replaced at no expense to the Department.
- 3.5. Grouting. Grout all voids between the host pipe or box culvert and the liner pipe. Submit for approval a detailed grouting plan, including provisions for holding the liner pipe in position and maintaining the flowline, before starting grouting operations. Take corrective action if the insert pipe shifts or moves at no expense to the Department. Provide bulkheads at each open end of a pipe run. Pump grout or flowable fill from the one pipe end to completely fill the voids at a pressure low enough to fill the voids without distorting the liner pipe. Do not penetrate the host or liner pipe for grouting without prior approval. Provide an open-ended, high point tap or equivalent vent at the discharge bulkhead.

4. MEASUREMENT

This item will be measured by the foot of liner pipe installed, measured along the flowline of the liner pipe. For multiple culverts to be lined, the measurement length will be the sum of the lengths of each barrel.

This is a plan quality measurement item and the quantity paid for shall be that quantity shown in the proposal and on the "Estimate and Quantity" sheet of the contract plans, except as shall be modified by Article 9.2. If no adjustment of quantities is required additional measurements or calculations will not be required.

5. PAYMENT

The work performed and the materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for as the unit bid for "Slip Lining Pipe or Box Culverts" of the size and shape specified. This price shall be full compensation for cleaning existing pipe; for furnishing, hauling, installing liner pipe and placing grout, all connections and for all labor, tools equipment, materials, clean-up and incidentals.

Excavation and backfill shown in the plans will be paid for in accordance with Item 400, "Excavation and Backfill for Structures."

Trench or excavation protection will be paid for in accordance with Item 402, "Trench Excavation Protection" or Item 403, "Temporary Special Shoring." Safety end treatments will be paid for in accordance with Item 467, "Safety End Treatment."