# ITEM 603.9803XX06 - LINING EXISTING CULVERT WITH SMOOTH INTERIOR, OPTIONAL TYPE PIPE

## DESCRIPTION:

The work shall consist of lining existing culverts, grouting, and minor earthwork around the inlet and outlet in accordance with this specification and the contract plans and proposal. The type of pipe shall be the Contractor's choice of Smooth Interior High Density Polyethylene Pipe (HDPE) or Polyvinyl Chloride Pipe (PVC).

## MATERIALS:

Materials will meet the requirements of the following specifications:

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| HDPE | |
| Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe | ASTM F 894-94a |
| Polyethylene (PE) Plastic Pipe (SDR-PR) [Based on Outside Diameter] | ASTM F 714-90 |
| PVC | |
| PVC Corrugated Sewer Pipe with Smooth Interior Fittings | ASTM F 949 |
| PVC Profile Sewer Pipe Controlled Inside Diameter | ASTM F 794 |
| PVC And CPVC Compounds | ASTM D 1784 |
| All types | |
| Joints | ASTM D-3212 |
| Gaskets | ASTM F-477 |
| Ring Stiffness Constant (RSC) | Class 100 (min) |
| Standard Dimension Ratio (SDR) | SDR 32.5 (min) |
| Grout: | |
| Maximum Cast Density | 600kg/cu meter |
| Minimum Compressive Strength | 825 kPa |

## CONSTRUCTION DETAILS:

Existing Culvert Preparation: Dewater, clean and inspect the existing culvert. The Contractor shall submit in writing a plan for control of water prior to the beginning of work.

Handling and Assembly of Pipe: The pipe shall be handled and assembled in accordance with the manufacturer's instructions. All pipe and accessories shall be stored on flat, level ground with no rocks or other sharp objects under the pipe. The pipe shall be inserted consistent with the existing culverts line and grade. To facilitate placement and proper alignment of the new pipe, the Contractor shall install skids on the pipe liner. The Contractor can propose an alternate method to place and align the new pipe, subject to the approval of the Engineer.

If the Contractor chooses to install skids, the skids should be two-meter minimum lengths and staggered along the entire length of the liner pipe. The staggered skids shall be spaced such that grout will freely flow beneath the entire inserted pipe.

The Contractor shall pull a single section of the liner pipe through the existing pipe as a test before sliplining the pipe. The liner pipe shall be joined and inserted into the existing culvert working one barrel at a time until completion. The jacking or pushing equipment shall distribute the forces evenly over the circumferential cross section of the pipe. Pipe sections may be pushed or pulled into place.

Damaged Pipe and Repair: Pipe sections damaged or disturbed through any cause prior to contract acceptance shall be repaired or replaced as directed by the Engineer at the Contractor's expense. Pipe sections which are defective and determined by the Engineer to be unrepairable, are unacceptable and shall be replaced at no cost to the State.

Grouting Details: Standing water shall be removed prior to the placement of the grout. Bulkheads shall be placed at the ends of each section to be grouted with the fill pipe inserted into the bulkhead at one end and a pressure relief at the other end extending above the pipe.

Once the liner pipe has been installed for the full length of the culvert, the Contractor shall proceed to grout the annular space between the existing culvert and the liner pipe. The Contractor shall submit a detailed plan to the Engineer that will show how they will anchor the liner in the invert for a period of time long enough for the grout to set where buoyant uplift is a factor. The grout Contractor shall take all necessary precautions to prevent floatation of the liner and maintain grade of the liner during the grouting operation. Provisions shall be made for pressure relief so that the allowable grout pressure of the pipe is not exceeded.

Qualifications: The Contractor shall submit for approval a proposed lightweight cellular grout mix design, expected grout pressures and method of placement to the Engineer. In addition, the applicator who shall perform the mixing and installation of the grout shall have had previous experience in this type of work.



**METHOD OF MEASUREMENT:**

This work will be measured as the number of linear meters of pipe installed. Measurement will be made along the bottom centerline of the pipe.

**BASIS OF PAYMENT:**

The unit price bid per linear meter shall include the cost of furnishing all labor, materials, and equipment necessary to install, grout, and excavate/backfill the inlet and outlet ends of the liner pipe. End sections shall be paid for under their respective items.

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Payment will be made under:

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| 603.98032006 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 450 mm nominal inside diameter. |
| 603.98032406 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 600 mm nominal inside diameter. |
| 603.98033206 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 750 mm nominal inside diameter. |
| 603.98033606 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 900 mm nominal inside diameter. |
| 603.98034206 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1050 mm nominal inside diameter. |
| 603.98034806 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1200 mm nominal inside diameter. |
| 603.98035406 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1350 mm nominal inside diameter. |
| 603.98036006 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1500 mm nominal inside diameter. |
| 603.98036606 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1650 mm nominal inside diameter. |
| 603.98037206 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 1800 mm nominal inside diameter. |
| 603.98038406 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 2100 mm nominal inside diameter. |
| 603.98039606 | Lining Existing Culvert with Smooth Interior Optional Type Pipe, 2400 mm nominal inside diameter. |

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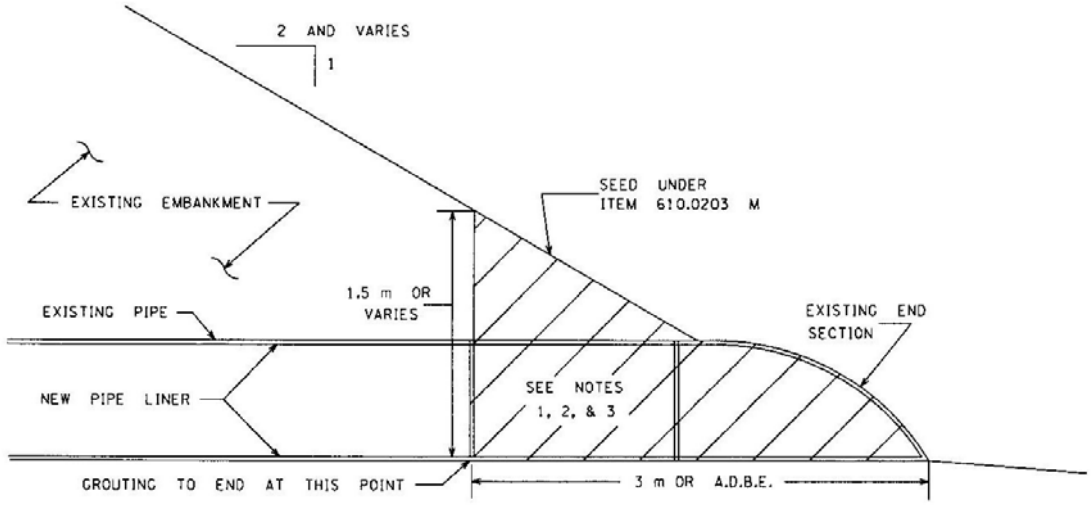


NOTES

NOTE 1: REMOVE EXISTING END SECTION, PIPE SECTION, AND EMBANKMENT MATERIAL UNDER THE PIPE LINING ITEM, 603.9803XX06.
NOTE 2: THE NEW END SECTION SHALL BE PAID FOR UNDER THE APPROPRIATE END SECTION ITEM NUMBER.
NOTE 3: THE BACKFILL SHOWN ON THE NEW OPTIONAL LINER AND END SECTION SHALL BE PAID FOR UNDER THE PIPE LINING ITEM, 603.9803XX06.