

# Manitoba



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**Manitoba Infrastructure and Transportation  
Materials Engineering Branch**

## Materials Specification for Supplying

Small Diameter High Density Polyethylene (HDPE) Culverts  
300mm to 900 mm

February 2008



## **Special Terms and Conditions**

1. Material required on site and delivered F.O.B. destination and unloaded (describe site location).

2. Specifications:

The moulding or extrusion material shall be polyethylene compounds and be constructed in accordance with the requirements of one or more of the following standards: CAN/CSA B182.8, AASHTO M294, ASTM D2412, ASTM D3350, ASTM F477 and meet the following specifications:

2.1 Materials

- Shall be manufactured from virgin polyethylene (PE) compounds which shall meet or exceed the cell classification requirements 324400C as defined in ASTM D3350.
- Shall comply with the specification for smooth inner wall HDPE pipe meeting standard designations for CAN/CSA B182.8 or AASHTO M294.

2.2 Requirements

- Shall have a minimum pipe stiffness of 210 kPa at 5% deflection when tested in accordance with ASTM D2412.
- Shall have a smooth interior that, for design purposes, provides a Manning 'n' value ranging from 0.010 to 0.012..

2.3 Joints

- Shall provide a water tight joining system. Joining systems shall be bell and spigot with elastomeric gasket, threaded or extrusion welded. Where in the case of utilizing the elastomeric gaskets, gaskets shall meet the requirements of CAN/CSA B182.8 or ASTM F477
- Split coupler systems will not be accepted.

3. Approvals:

This item must be approved as identified on the Department's Products Standards List or be approved for use by the Department to qualify for purchase.



## **Construction Notes**

The Department's *Specifications for Removing Culverts and Placing Culverts*, No. 400, dated March 2002, shall be used as a guideline with the following modifications:

1. Granular Backfill (Culvert Gravel)

High density polyethylene (HDPE) culverts require granular backfill (culvert gravel) extending from the springline to 300 mm above the crown of the pipe at lifts of 150 mm. Compact to 95% Standard Proctor Density, as shown in Figure 1: *Trench Cross Section*.

2. Final Backfill

Final backfill to achieve design grade shall be excavated material or material similar to the roadway embankment. Do not place large rocks or clumps within 600 mm of pipe.

3. Trench Width

- The minimum trench width shall be three times of the normal pipe diameter, 3D width.
- Spacing for Parallel Pipes: For two or more parallel pipes in a common trench, properly compacted backfill is required between pipes. Minimum spacing between pipes shall be 450mm.

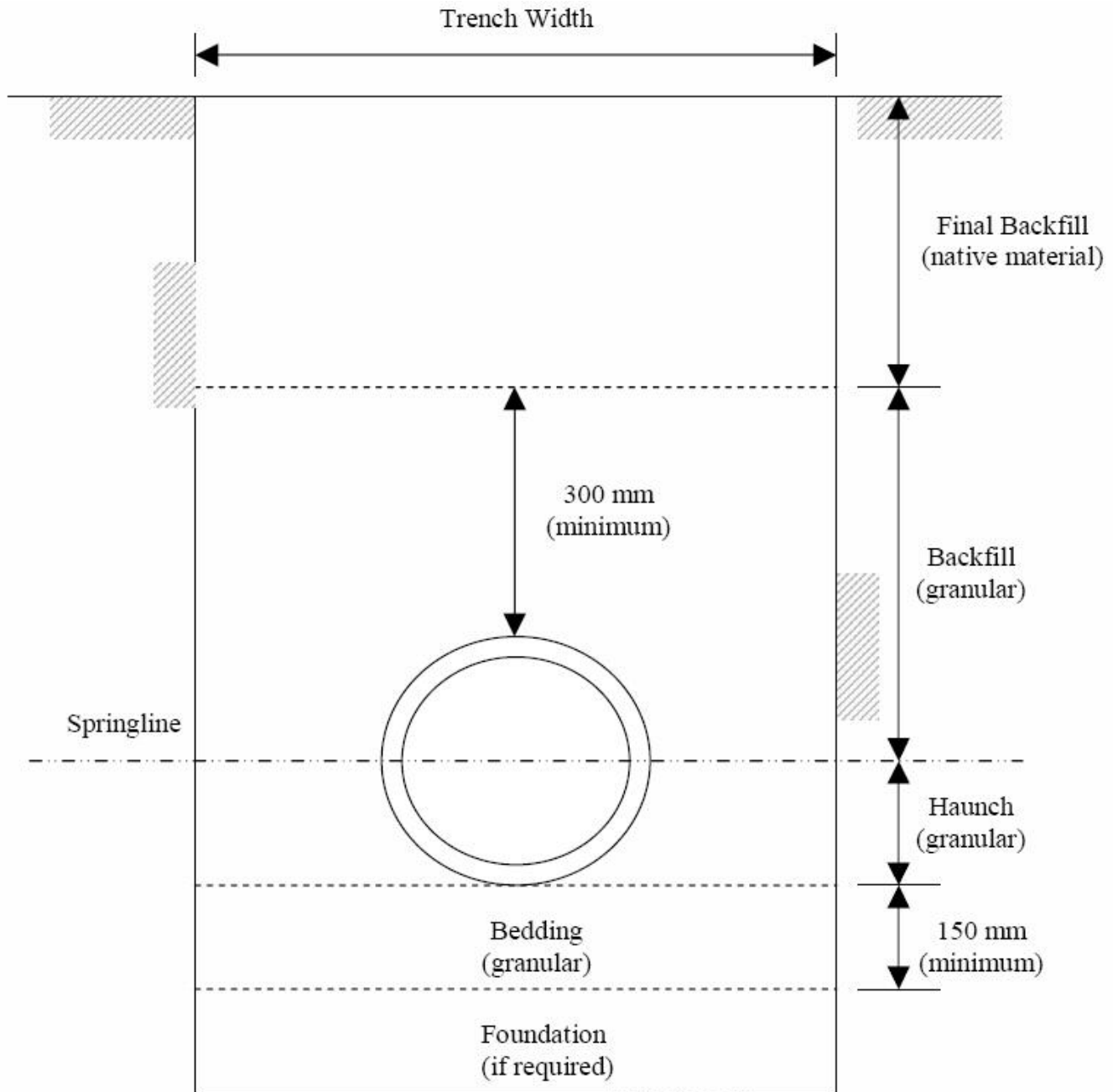


Figure 1: Trench Cross Section