

Public Works and Government Services Canada
Brandon Research Centre Irrigation System
Project No. R.077363.002

APPENDIX B
MWSB – HIGHWAY, RAILWAY, ROADWAY
AND UTILITY CROSSINGS

APPENDIX B

MWSB – HIGHWAY, RAILWAY, ROADWAY AND UTILITY CROSSINGS



Part 1 General

1.1 DESCRIPTION OF WORK

- .1 The work described hereunder shall consist of the excavation of trenches and tunnels; the supply and installation of pipe and/or encasement pipe; the supply and placement of bedding and backfill materials; the disposal of all surplus and unsuitable material and the restoration of the site; all as related to the construction of sewer and water pipelines or watermains through highway, railways, roadway, driveway and utilities crossings. The work shall also include shoring and other protective works necessary for and incidental to the safe and proper execution of the work and the necessary drainage and dewatering of all excavations.
- .2 “Tunnelling” shall mean augering, horizontal directional drilling, pushing or coring beneath the ground surface.

1.2 STANDARDS

- .1 Manitoba Infrastructure & Transportation
215 Garry Street
Winnipeg MB R3C 3Z1
Work Zone Traffic Control Manual
- .2 Transport Canada
330 Sparks Street
Ottawa Ont K1A 0N5
Standard TC E-10, June 21, 2000
- .3 CSA International
178 Rexdale Boulevard
Toronto Ont M9W 1R3
- .4 National Energy Board
444 Seventh Avenue SW
Calgary Alberta T2P 0X8
Regulation Part 1-50R/88-528

The Standards referred to shall be the most recent edition.

1.3 JOB CONDITIONS

- .1 The Contractor shall comply with all the requirements and regulations of the latest edition of the Manitoba Infrastructure and Transportation Work Zone Traffic Control Manual.



- .2 The Contractor shall be responsible for obtaining and paying for all permits, licences, or any other approvals required to undertake crossings as described in this Specification. The Contractor shall comply with all Federal, Provincial, Municipal, Railway and utility regulations as they apply to the work and under this Specification. The Contractor shall request a listing of approvals required and contacts from the Engineer and ensure that a minimum of 72 hours notice is provided to the approval authority prior to commencing construction within or across the right-of-way under their jurisdiction. The Contractor shall make arrangements for site supervision and inspection with the approval authority as required.
- .3 The Contractor shall take note of Clause 1.5.4, Section 022180, Pipe Excavation, Bedding and Backfill. The Contractor shall use hand tools or Hydrovac-Daylighting to expose existing buried works. Compacted select granular backfill shall be used within three meters of any existing utility works and shall be considered incidental to the works of the Contract.
- .4 The Contract may require the Contractor to work near existing structures; therefore it shall be the Contractor's responsibility to contact local authorities and homeowners where required to establish locations of existing underground works (septic fields, waterlines, sewer lines, underground utilities, etc.) within the construction areas. The Contractor shall take all precautions necessary to avoid damage to existing works. The Contractor shall coordinate connections to existing pipelines with the Engineer and local authorities a minimum of 48 hours prior to commencing construction.
- .5 It is the Contractor's responsibility to notify utility companies to arrange for the location and marking of buried infrastructure in advance of construction operations.

Part 2 PRODUCTS

2.1 APPROVED PRODUCTS

- .1 Products shall be supplied in accordance with the Listing of Approved Products in the attached Appendix, as shown on the Plans, or specified in Section 01001, Special Provisions.

2.2 BEDDING AND BACKFILL

- .1 Bedding and backfill material shall conform to the requirements of Clause 2.1 and 2.4 of Section 022180, Pipe Excavation, Bedding and Backfill.



2.3 PIPE

- .1 Pipe and related products (gaskets, lubricants and other such materials as are required to join the pipe) shall conform to the relevant specifications set forth in Part 2 of whichever of the following Sections is applicable:
 - .1 Section 027030 – Sewers
 - .2 Section 027060 – Pressure Pipelines
 - .3 Section 027020 – Water Service Connections

2.4 ENCASEMENT PIPE

- .1 Encasement Pipe required for Highway, Provincial Road, Service Road and Railway Crossings, shall be supplied as detailed on Plans or the Standard drawings, pages 6 & 7 of this Section.

Part 3 EXECUTION

3.1 EXCAVATION BEDDING, AND BACKFILL

- .1 The requirements of Part 3, Section 022180, Pipe Excavation, Bedding and Backfill shall apply to this Section.

3.2 ALIGNMENT AND GRADE

- .1 The pipeline shall be laid to the grade and alignment shown on the plans or as staked on the ground by the Engineer.

3.3 CONSTRUCTION OF PIPELINE

- .1 Except as provided in Clause 1.2 of this Section, the installation of the pipe and encasement pipe shall conform to the relevant clauses set forth in Part 3 of the following applicable Sections;
 - .1 Section 027030 – Sewers
 - .2 Section 027060 – Pressure Pipelines
 - .3 Section 027020 – Water Service Connections

3.4 HIGHWAY AND PROVINCIAL ROAD CROSSINGS

- .1 Highway and PR Crossings – Shall be carried out in accordance with the typical PTH/PR crossing Standard Drawing, page 7 of this section and in accordance with the crossing agreement prepared by Manitoba Infrastructure & Transportation and as follows:



- .1 Provide 3 days (72 hours) written notice to the local district office of Manitoba Infrastructure & Transportation (copy to Engineer) prior to commencing construction requesting approval for the proposed crossing date and for a site meeting 1 day before crossing date.
- .2 Arrange for the safe movement of highway vehicle and pedestrian traffic during construction in accordance with the latest edition of the Manitoba Infrastructure & Transportation Work Zone Traffic Control Manual.
- .3 Provide a minimum of 3 metres clearance from the existing road shoulder to the nearest excavation. Encasement pipe shall be used for all crossings as detailed on the typical PTH/PR crossing standard drawing, Page 7 of 7.
- .4 All highway and PR crossings shall be installed by tunnelling in accordance with Clause 3.9 of Section 022180, Pipe Excavation, Bedding and Backfill. If tunnelling cannot be undertaken due to site conditions, the following shall apply;
 - .1 Obtain Manitoba Infrastructure & Transportation approval to open cut the roadway crossing.
 - .2 Complete all open cut crossing works in conformance with Manitoba Infrastructure & Transportation requirements.
- .5 Restore all surface areas within the Manitoba Infrastructure & Transportation right-of-way to the condition that existed prior to construction and be responsible to correct trench settlement and related works in accordance with contract warranty conditions.

3.5 RAILWAY CROSSINGS

- .1 Railway crossings – Shall be carried out in accordance with the typical railway crossing standard drawing, page 6 of 7 of this Section, Transport Canada Standard TC E-10 and the latest edition of the applicable CSA Standard.
- .2 The Contractor shall be responsible for all costs associated with the work including flagmen, site inspection by the railway authority and total site restoration to the satisfaction of the railway authority. All railway crossings complete with steel encasement pipe shall be installed by tunnelling in accordance with Clause 3.9 of Section 022180, Pipe Excavation, Bedding and Backfill.

3.6 RURAL MUNICIPALITY ROAD CROSSINGS

- .1 Municipal Roadway crossings – Shall be tunnelled in accordance with Clause 3.9 of Section 022180, Pipe Excavation, Bedding and Backfill of these specifications. Encasement pipe is not required for municipal roadway crossings. The Contractor will be allowed to open cut municipal road crossings provided he obtains prior approval from the Engineer and local authorities.



- .2 The Contractor shall utilize compacted select granular backfill for open cut municipal roadway crossings in accordance Clause 3.8.3 of Section 022180. Open cut installations under paved roads shall be installed in accordance with Clause 1.5 of Section 022180. The Contractor shall be responsible for the total restoration of all affected surface areas within the municipal road right-of-way including the replacement of gravel.

3.7 DRIVEWAY AND APPROACH CROSSINGS

- .1 Private Driveways and Approach Crossings – Shall be restored to original condition including the replacement of gravel and existing surface pavement material. Open cut driveways and approaches shall be backfilled in accordance with Clause 3.8.2 of Section 022180; Pipe Excavation, Bedding and Backfill. Where required, existing culverts shall be removed in accordance with Section 027050; Removing Existing Culverts and if deemed to be in salvageable condition, the culvert shall be reinstalled in accordance with Section 024360; Placing Pipe Culverts and Pipe Arches.
- .2 If it is determined that an existing culvert is non-salvageable, the Owner will supply a replacement culvert which shall be installed by the Contractor in accordance with Section 024360. Open cut installations under paved driveways and approaches shall be installed in accordance with Clause 1.5 of Section 022180.

3.8 TELEPHONE AND FIBRE OPTIC CROSSINGS

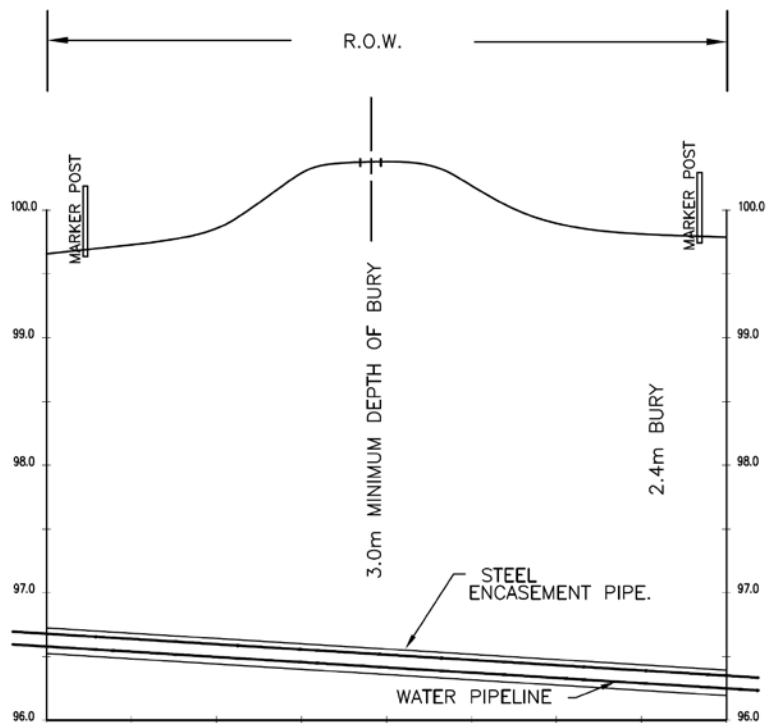
- .1 Buried Telephone And Fibre Optic Crossing – Shall be undertaken in accordance with this Section and as required by the local telephone or cable authority.

3.9 BURIED HYDRO CROSSINGS

- .1 Buried Hydro Crossings – Shall be undertaken in accordance with this Section and as required by the local Hydro Authority.

3.10 GAS AND OIL PIPELINE CROSSINGS

- .1 Buried Natural Gas or Petroleum Pipeline Crossings – Shall be undertaken in accordance with this Section, The National Energy Board Pipeline Crossing Regulations, Part 1 – S0R/88-528 and as required by the Pipeline Authority.

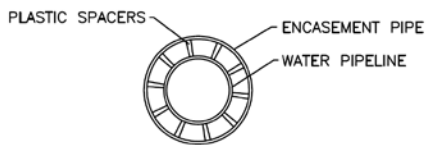


RAILWAY CROSSING

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NOTE:

1. RAILWAY CROSSING SHALL BE "HORIZONTAL DIRECTIONAL DRILL WITH DRILLING MUD PRESSURE USED TO KEEP HOLE OPEN, WHILE PULLING PIPE BACK THROUGH HOLE, WITH NO GROUND DISTURBANCE WITHIN RAILWAY RIGHT OF WAY.
2. CROSSING SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH TC E-10 AND LATEST EDITION OF APPLICABLE CSA STANDARD.
3. ENCASEMENT PIPE SHALL BE ASTM A53 GRADE B STEEL PIPE, MINIMUM WALL THICKNESS 7.2 mm (0.28"), MINIMUM YIELD STRENGTH 242 mPa (35,000psi).
4. STEEL PIPE SHALL BE WELDED TO FORM A SINGLE PIPE, WELD SHALL CONFORM TO AWWA C206, STANDARD FOR FIELD WELDING OF STEEL WATER PIPE.
5. WATER PIPELINE: HDPE DR17 OR PVC SERIES 160
6. OPERATING PRESSURE: 350-550 kPa (50-80psi).
STATIC TEST PRESSURE: 670kPa (100psi) AS PER SECTION 027060.
7. WATER PIPELINE ANGLE AT CROSSING VARIES TO RAILWAY RIGHT OF WAY.
8. ENDS OF ENCASEMENT PIPE WILL NOT BE SEALED.



CROSS-SECTION

N.T.S.

STANDARD CONSTRUCTION SPECIFICATIONS
THE MANITOBA WATER SERVICES BOARD
 PROVINCE OF MANITOBA

TYPICAL
RAILWAY CROSSING



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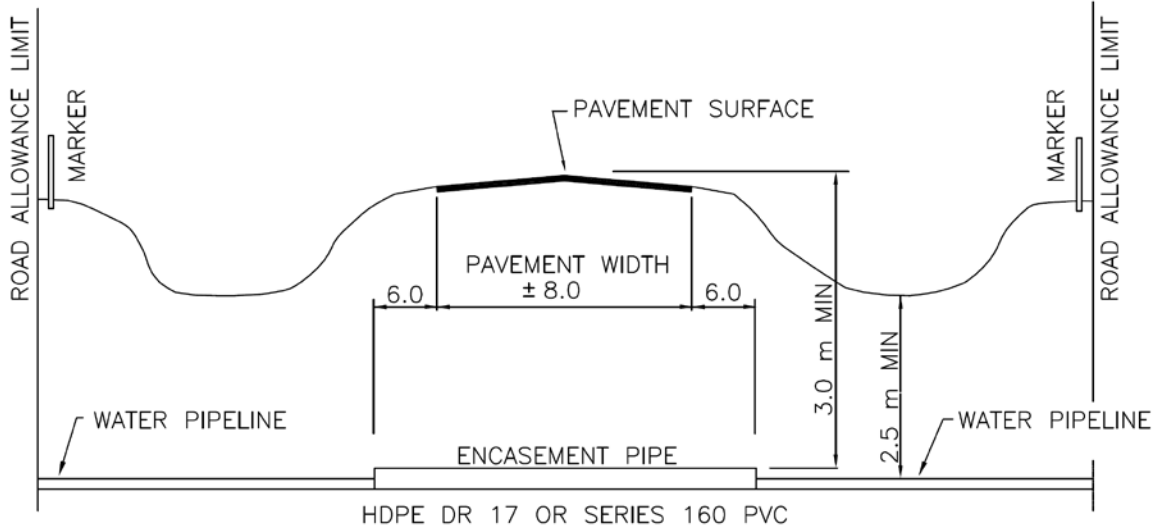
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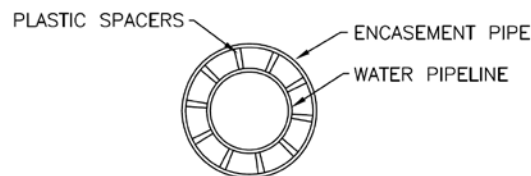
TYPICAL PTH/PR CROSSING

NTS

ENCASEMENT PIPE DIAMETER FOR HDPE SHALL BE 50mm LARGER THAN THE DIAMETER OF THE PIPELINE UP TO AND INCLUDING 100mm.

ENCASEMENT PIPE DIAMETER FOR PVC SHALL BE 50mm LARGER THAN THE DIAMETER OF THE BELL OF THE PIPELINE UP TO AND INCLUDING 100mm.

ENCASEMENT PIPE DIAMETER FOR HDPE AND PVC SHALL BE 100mm LARGER THAN THE DIAMETER OF THE PIPELINE FOR PIPELINES LARGER THAN 100mm.



CROSS-SECTION

N.T.S.

STANDARD CONSTRUCTION SPECIFICATIONS
THE MANITOBA WATER SERVICES BOARD
 PROVINCE OF MANITOBA

TYPICAL
PROVINCIAL TRUNK HIGHWAY
& PROVINCIAL ROAD CROSSING



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