

Part 1 General

1.1 REFERENCES

- .1 City of Winnipeg
 - .1 City of Winnipeg Standard Construction Specification CW 2130 - Gravity Sewers, CW 2030 - Excavation Bedding and Backfill, CW3170 - Sub-Grade, Sub-Base and Base Course Construction [December 2015] in Appendix B.
 - .2 For this specific project the word Contract Administrator in the City of Winnipeg Construction Specifications shall refer to Departmental Representative.

1.2 APPROVED PRODUCTS FOR UNDERGROUND USE AND SURFACE WORKS

- .1 The Contractor shall obtain the latest information available at the time relative to Approved Products for Underground Use and Surface Works in the City of Winnipeg. The City of Winnipeg Approved Products List is available on the City of Winnipeg internet site at:
http://www.winnipeg.ca/finance/findata/matmgt/std_const_spec/current/Docs/Approved_Products_Underground_Works.pdf

1.3 SUBMITTALS

- .1 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.

Part 2 Products

2.1 MATERIALS

- .1 Catch Basin shall be 900 mm diameter as shown on the design drawings and in accordance with the specifications referenced in clause 1.2 of this specification
- .2 The Catch basin shall include:
 - 900mm DIA pre-cast CB / Sump / precast floor (900 DIA. Precast Concrete Catch basin barrel to ASTM C 478 AND C 76 CL II)
 - 900mm x 750mm pre-cast reducer;
 - Maximum 2 - 750Ø Precast Concrete Adjusting Rings
 - Standard Frame (AP-004) and Standard Grated Cover (AP-006)

2.2 INSTALLATION

- .1 Level bedding to ensure catch basin is uniformly supported and the floor is level.

- .2 Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% maximum proctor density to ASTM D698.
- .3 Install catch basin sections plumb and level. Variance from line and grade to be in accordance with Section 3.6 of CW 2130.
- .4 Install approved gasket or joint sealer between pre-cast concrete sections including 750 millimetre diameter riser adjusting rings and between frame and pre-cast concrete riser as construction progresses. Alternately install grout between frame and pre-cast concrete risers as approved and directed by Departmental Representative. Ensure grout completely fills space between frame and riser to make joint watertight and finish flush with inside surface of risers.
- .5 Connect sewers to catch basin at invert elevations shown on the Drawing C02 and grout in place to make a watertight connection. Coat outside of pipe end for a length equal to the catch basin wall thickness plus 150 millimetres with an approved cementing agent to which sand has been added and allow mixture to harden before grouting in place.
- .6 Compact backfill between catch basin and the sides of the trench or excavation in accordance with CW 2030.
- .7 Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.
- .8 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

2.3 BACKFILL

- .1 The catch basin base section shall be bedded on a thoroughly compacted 150 mm thick Type 3 bedding material. This bedding shall be fully compacted and levelled throughout the full trench width to the exact grade specified so that the base section is uniformly and fully supported and the floor is level. The space between the outside of the catch basin and the embankment shall be backfilled to Class 4 standards. The Contractor shall pay particular attention to the earth filling around the catch basin to ensure that the required compaction is achieved. Embankment works shall be in accordance with CW3170 latest edition.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 City of Winnipeg
 - .1 City of Winnipeg Standard Construction Specification CW 2130 - Gravity Sewers, Section CW2030 – Excavation, Bedding and Backfill [December 2015] in Appendix B.
 - .2 For this specific project the word Contract Administrator in the City of Winnipeg Construction Specifications shall refer to Departmental Representative.
- .2 ASTM International
 - .1 ASTM F405-05, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings.
 - .2 ASTM D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

1.2 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.
- .4 Submit to Departmental Representative for testing, at least 2 weeks prior to beginning Work, following samples of materials proposed for use.
- .5 Certification to be marked on pipe
- .6 Submit to Departmental Representative 1 copy of manufacturer's installation instructions.

Part 2 Products

2.1 CORRUGATED HDPE DRAINAGE PIPE

- .1 Supply and install 375mm dual wall corrugated HDPE drainage pipe
- .2 High Density Polyethylene resin to meet a minimum cell class of 424420C as defined by ASTM D3350.
- .3 320kPa stiffness, certified to CSA B182.8 with the CSA logo; bell and spigot joints.

2.2 BEDDING AND BACKFILL

- .1 The bedding and backfilling for the storm sewers installed in open trenches shall be Class 4. Governed by his compaction equipment and the type and strength of pipe, the Contractor shall ensure that there is adequate cover on the pipe to prevent damage during compaction operations. Refer to Section CW2130 - Gravity Sewers and Section CW2030 – Excavation, Bedding and Backfill

Part 3 Execution

- .1 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of Engineer.

3.2 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 33 01- Excavating, Trenching and Backfilling
- .2 Do not allow contents of sewer or sewer connection to flow into trench.
- .3 Trench alignment and depth to approval of Departmental Representative prior to placing bedding material and pipe

3.3 INSTALLATION

- .1 Lay and join pipes in accordance with the City of Winnipeg specifications, section CW2130 - Gravity Sewers.

3.4 FIELD TESTING

- .1 Repair or replace pipe, pipe joint or bedding found defective.
- .2 Draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
- .3 Remove foreign material from sewers and related appurtenances by flushing with water.
- .4 Television and photographic inspections:
 - .1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.
 - .2 Provide means of access to permit Departmental Representative to do inspections.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 City of Winnipeg
 - .1 City of Winnipeg Standard Construction Specification CW2130 – Gravity Sewers, CW 3170- Earthwork and Grading, CW 2030- Excavation Bedding and Backfill, CW 3610 - Installation of Culverts [December 2015] in Appendix B.
 - .2 For this specific project the word Contract Administrator in the City of Winnipeg Construction Specifications shall refer to Departmental Representative.
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
- .3 ASTM International
 - .1 ASTM C76M-10a, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).
 - .2 ASTM C443M-10, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).
 - .3 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).

1.2 APPROVED PRODUCTS FOR UNDERGROUND USE AND SURFACE WORKS

- .1 The Contractor shall obtain the latest information available at the time relative to Approved Products for Underground Use and Surface Works in the City of Winnipeg. The City of Winnipeg Approved Products List is available on the City of Winnipeg internet site at:
http://www.winnipeg.ca/finance/findata/matmgt/std_const_spec/current/Docs/Approved_Products_Underground_Works.pdf

1.3 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for pipes and backfill and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.

- .4 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work.
- .5 Certification is to be marked on pipe.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect pipes from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 CONCRETE PIPE

- .1 Supply and install 300mm reinforced concrete pipe ASTM C76-5, CSA A257.5-5, Concrete strength 41.4 Mpa
- .2 Rubber gaskets for joints: to CSA A257, ASTM C443M.
- .3 Cement mortar joint filler:
 - .1 Portland cement: to CSA A3000 type 10.
 - .2 Sand: to ASTM C144.
 - .3 Mortar: one part by volume of cement to two parts of clean, sharp sand mixed dry. Add sufficient water after mixing for optimum consistency for hand application.

2.2 GRANULAR BEDDING

- .1 The concrete culvert shall be bedded on a thoroughly compacted 200 mm thick Type 3 bedding material as per Section CW2030 of the City of Winnipeg specifications.

Part 3 Execution

3.1 TRENCHING

- .1 Perform trenching Work in accordance with Section 31 23 33 01 - Excavating Trenching and Backfilling.

- .2 Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.2 BEDDING

- .1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .2 Place minimum thickness of 200 mm of approved granular material on bottom of excavation and compact to minimum 95% maximum density to ASTM D698.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

3.3 JOINTS: CONCRETE PIPE CULVERTS

- .1 Joints may be made with rubber gaskets, bituminous jointing compound or Portland cement mortar.
 - .1 Rubber gasket joints:
 - .1 Install in accordance with manufacturer's written recommendations.
 - .2 Ensure that tapered ends are fully entered into flanged ends.
 - .2 Bituminous filled joint:
 - .1 Make joint with excess of filler to form continuous bead around outside of pipe and finish smooth on inside.
 - .3 Mortar joints:
 - .1 Prepare mortar as specified herein.
 - .2 Clean pipe ends and wet with water before joint is made.
 - .3 Place mortar in lower half of flanged end of pipe section in place.
 - .4 Apply mortar to upper half of tapered end of pipe section being installed.
 - .5 Join pipe ends and force joint up tight, taking care to ensure inner surfaces of abutting pipe sections are flush and even.
 - .6 Clean inside of pipe and annular space between ends of pipes after each joint is made.
 - .7 Fill joint with mortar and finish smooth and even.
 - .8 For pipes 800 mm or less diameter, fill joints before mortar in joints has set.

3.4 BACKFILLING

- .1 Backfill around and over culvert shall the sub-base and base material of the access road.

END OF SECTION