

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for pipe culverts.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures;
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal;
- .3 Section 31 23 13 - Excavating, Trenching and Backfilling;
- .4 Section 31 05 17 - Aggregate Materials;
- .5 Section 33 46 16 – Subgrade drainage network.

1.3 MEASUREMENT PROCEDURES

- .1 Measure the supply and installation of pipes and culverts for storm sewer, including excavation, backfill and bedding in meters for each diameter, type and class of pipe installed.
- .2 The supply and installation of materials for pipe culverts and storm sewer shall include, where appropriate, the necessary dewatering for works, maintenance and dismantling of temporary detour roads.

1.4 REFERENCES

- .1 Bureau de normalisation du Québec (BNQ)
 - .1 NQ 2560-114/2002, Travaux de génie civil – Granulats.
 - .2 NQ 3624-120/2006, Tuyau et raccords en polyéthylène (PE) – tuyau à profil ouvert ou fermé à paroi intérieure lisse pour l'égout pluvial et le drainage des sols – caractéristiques et méthodes d'essai.
 - .3 NQ 1809-300/2004 (2007), Travaux de construction - Clauses techniques générales - Conduites d'eau potable et d'égout
 - .4 NQ 2622-126/2009, Tuyaux et branchements latéraux monolithiques en béton armé et non armé pour l'évacuation des eaux d'égout domestique et pluvial.

1.5 SUBMITTALS

- .1 Submit samples (2) two weeks prior to work in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Certificate of conformity shall contain the following information:
 - .1 The name of the manufacturer
 - .2 The date and place of manufacture, batch number or production;
 - .3 The category, nominal shape and dimensions, including the wall thickness;
 - .4 The chemical properties of the material.
- .3 Certification to be marked on pipe.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with the manufacturer's requirements.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by Ministerial Representative.
- .5 Divert unused concrete materials from landfill to local quarry facility as approved by Ministerial Representative.
- .6 Dispose of unused aggregate according to Section 31 05 17 – Aggregates materials.
- .7 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 CONCRETE PIPE

- .1 Reinforced concrete pipe: to BNQ 2622-126, 250 mm dia, strength classification V.
- .2 Plastic pipes and connections: In Polyethylene with smooth interior walls, to BNQ 3624-120, of R320 category.
 - .1 Type 1 : non perforated pipe of 300 mm diameter (for catch basin outlet).
 - .2 Plugs and connections shall be made by the same manufacturer of pipe.
 - .3 Outlet grids of drains shall be made by the same manufacturer of pipe.

2.2 GRANULAR BEDDING [AND BACKFILL]

- .1 Granular bedding and backfill material is crush stone of MG20 type to Section 31 05 17 - Aggregate Materials and following requirements:

2.3 GEOTEXTILE

- .1 Geotextile shall be of type III as prescribed in section 13101 of MTQ standard.

Part 3 Execution

3.1 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 13 – Rough grading.
- .2 Bedding of shall be compacted to 95 % of the maximum density to ASTM D698

- .3 Obtain Ministry representative 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% of corrected maximum dry density.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 33% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Ministry representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

3.3 LAYING CONCRETE PIPE CULVERTS

- .1 Begin pipe placing at downstream end.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.
- .4 Lay paved invert or partially lined pipe with longitudinal centre line of paved segment coinciding with flow line.
- .5 Do not allow water to flow through pipes during construction except as permitted by Ministry representative.

3.4 JOINTS: CONCRETE PIPE CULVERTS

- .1 Place two layers of geotextile at every joint at overlap.

3.5 LAYING CORRUGATED POLYETHYLENE PIPE CULVERTS

- .1 Place pipe on prepared bedding with respect to prescribed lines and levels and making sure that the inside of pipe forms a straight line with no low or high points.
- .2 Ensure bottom of pipe is in contact with shaped bedding throughout pipe length.
- .3 Start installation of pipe from discharge point proceeding towards upstream.
- .4 Place pipes guiding the female ends of the upward slope.
- .5 Make tight joints as per manufacturers' instructions

3.6 BACKFILLING

- .1 Place granular backfill material MG20 as indicated in 300 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .2 Compact each layer to 95% corrected maximum dry density to ASTM D1557 taking special care to obtain required density under haunches.

- .3 Protect installed culvert with minimum 300 mm cover of compacted MG20 before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.
- .4 Before asphalt works, remove any MG20 excess.
- .5 Place backfill in unfrozen condition.

3.7 PIPE DISCHARGE

- .1 At pipe discharge, install grids as per detail on drawings and as indicated.

END OF SECTION