

PART 1 - GENERAL

- 1.1 Related Requirements
- .1 Section 31 05 17 - Aggregates: General.
 - .2 Section 31 23 10 - Excavating, Trenching and Backfilling.
 - .3 Section 31 32 19.01 - Geotextiles.
- 1.2 References
- .1 ASTM International
 - .1 ASTM D 698-07e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .2 CSA International
 - .1 CSA B1800-11, Thermoplastic Non-Pressure Pipe Compendium (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8, B182.11 and B182.13).
 - .1 CSA B182.2-11, PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings.
- 1.3 Action and Informational Submittals
- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for drainage material and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.4 Delivery, Storage and Handling
- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .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 off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect drainage material from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
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PART 2 - PRODUCTS

- 2.1 Materials
- .1 Granular bedding and surround: 28 mm Clear Stone, free from flat, elongated or other objectionable pieces in accordance with Section 31 05 17 and approved by the Departmental Representative prior to use.
 - .1 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1 and CAN/CGSB-8.2

<u>Sieve Designation</u>	<u>% Passing</u>
28 mm	100
20 mm	90 - 100
10 mm	0 - 40
5 mm	0 - 10

 - .2 Other properties as follows:
 - .1 Absorption: Max. 1.75%
 - .2 Plasticity Index: Max. 0
 - .3 Micro-Deval: Max. 25%
 - .2 Perforated, rigid plastic pipe and fittings: PVC to CAN/CSA B182.2
 - .1 Standard Dimensional Ratio (SDR): 35
 - .2 Nominal inside diameter 150 mm
 - .3 Perforated, with holes drilled at 4 o'clock and 8 o'clock positions.
 - .4 locked-in gasket and integral bell system.
 - .5 Nominal length: 6 m.
 - .3 Geotextile Filter: non woven synthetic fibre fabric, supplied in rolls, in accordance with Section 31 32 19.01 - Geotextiles.

PART 3 - EXECUTION

- 3.1 Trenching
- .1 Do excavating trenching and backfilling in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.
 - .2 Place bedding material after approval of excavation by Departmental Representative.
- 3.2 Bedding
- .1 Place 150mm layer of bedding material to full trench width and compact to minimum of 95% of maximum density to ASTM D 698.
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- 3.3 Installation of Pipe Sub-Drains
- .1 Lay pipe drains on prepared bed, true to line and grade with inverts smooth and free of sags or high points.
 - .1 Ensure barrel of each pipe is in contact with bed throughout full length.
 - .2 Begin laying at outlet and proceed in upstream direction.
 - .3 Lay perforated pipes with perforations at 4 o'clock and 8 o'clock positions.
 - .4 Lay bell and spigot pipe with bell ends facing upstream.
 - .1 Do not mortar joints.
 - .5 Make joints tight in accordance with manufacturer's instructions.
 - .6 Make watertight connections to existing drains, new or existing manholes and catch basins where indicated or as directed by Departmental Representative.
 - .7 Plug open upstream ends of pipes with watertight concrete, steel or wood bulkheads.
 - .8 Surround and cover drain with filter material in uniform 150mm layers granular surround of drain and compact to at least 95% maximum density to ASTM D 698.
 - .9 Wrap or sleeve perforated pipe with geotextile filter as indicated.
 - .10 Backfill remainder of trench to Section 31 23 10 - Excavating, Trenching and Backfilling and as indicated.
 - .11 Do not place bedding surround and backfill materials in frozen condition.
 - .12 Protect sub-drains against flotation during installation.
 - .13 Install "Y" connections to surface as indicated, for flushing.