

PART 1 - GENERAL

<u>1.1 Related Requirements</u>	.1	Section 31 05 17 - Aggregates: General.
	.2	Section 31 23 10 - Excavating, Trenching and Backfilling.
	.3	Section 31 32 19.01 - Geotextiles.
<u>1.2 References</u>	.1	ASTM International .1 ASTM D 698-07e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³)).
	.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.
<u>1.3 Action and Informational Submittals</u>	.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.
<u>1.4 Delivery, Storage and Handling</u>	.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.

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.
-

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.