1.0 GENERAL

1.1 REFERENCES

.1 Provide Polyvinyl Chloride (PVC) drain pipe in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

.1	ASTM D3034	Standard Specification for Type PSM Poly(Vinyl) Chloride (PVC) Sewer Pipe and Fittings.
.2	ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

.3 Canadian Standards Association (CSA)

.1	B1800 SERIES	Thermo-Plastic Nonpressure Pipe Compendium.

1.2 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged material.

.2 Unload and handle pipe by hand or using canvas slings to avoid scratching the pipe. Do not use individual chains or single cables.

.3 When handling pipe avoid impact blows, abrasion damage, and gouging or cutting by abrasive surfaces or sharp objects. Replace pipe with deep scratches as required by the Minister.

.4 Do not stack pipe higher than 1500 mm, and provide support for the barrel to prevent bending of the pipe. Do not expose stockpiled pipe to direct sunlight. Provide for air circulation through the stockpiled pipe.

.5 Store rubber gaskets in a warm, dark location until immediately prior to use.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 PVC drainpipe:

.1 Rigid PVC pipe including fittings in accordance with B1800 Series and ASTM D3034, with a dimension ratio (DR) of [35 and a minimum pipe stiffness of 320 KPa.]

.2 Bell and spigot type joints complete with rubber gaskets in accordance with B1800 Series and ASTM F477.

.3 Cylindrical and straight PVC pipe with ends cut square to the longitudinal axis, and with pipe walls that have a smooth finish free from imperfections such as grooves or ripples. Bevel the pipe ends as required for joining.

.4 PVC perforated pipe as specified in the Contract Documents. Shop drill [3 rows of mm diameter holes] [3 rows of mm wide by mm long slots] positioned at [120°] radial on the pipe, and spaced at [ ] mm to provide a minimum of [ ] mm^2 of opening area per metre of pipe length.

.3 Geotextile sock:

.1 Provide geotextile sock free of manufacturing defects, cuts, tears, or any other physical damage, and having the following properties:

[ ]

3.0 EXECUTION

3.1 EXCAVATION AND PREPARATION OF THE FOUNDATION

.1 Excavate the pipe foundation to the lines, grades, slopes, and elevations specified in the Contract Documents.

.2 Provide care of water to permit the work to be carried out in the dry.

.3 The Minister will identify unsuitable bearing soils when encountered at the earth foundation level. Perform [excavation, as classified by the Minister,] [Authorized Structure Over-Excavation] to remove unsuitable bearing soils and replace with [fill materials] [Authorized Fill Placement] as directed by the Minister.

.4 Compact the base of the excavation to provide a firm foundation of uniform density throughout the entire length of the pipe.

.5 Construct pipe bedding as specified in the Contract Documents. Shape the pipe bedding to conform to the bell joint for uniform support.

3.2 INSTALLATION

.1 Do not install the pipe when the ambient temperature is below –5°C or above 32°C. Shield the ends to be joined from direct sunlight prior to and during the laying operation.

.2 Inspect the gasket, gasket groove, and sealing surfaces for any damage or deformation. Both the bell and spigot ends must be free of irregularities. Strictly adhere to the manufacturer's written instructions for cleaning, setting the gasket, lubricating the ends of the pipes, and jointing.

.3 Install pipes with joints close and even abutting all around, and without any deflections at the joints unless specified otherwise.

.4 Install the pipe at the locations, of the sizes, and to the lines, grades, slopes, and elevations specified in the Contract Documents.

.5 Provide watertight pipe joints, and install the pipes so that they free of depressions and are free draining.

.6 When a laser beam is used to maintain grade, use manual survey methods to check the pipe invert at several intermediate locations and at the termination points.

.7 Install perforated pipes such that [1] row of perforations is along the top of the pipe.

3.3 FILL AND BACKFILL

.1 Do not commence fill placement operations until the installed pipes have been inspected by the Minister. Rectify defects, including any identified by the Minister.

.2 Provide fill, as specified in the Contract Documents, so that direct and continuous contact between the pipe wall and the fill material is attained.

.3 Within 600 mm of the pipe, remove stones larger than 80 mm diameter from the fill material. Place fill in lifts not exceeding 100 mm in thickness, and compact using pneumatic or mechanical hand tamping equipment.

.4 Compact each lift of fill at the moisture content and to the density specified in Section 02331 – Fill Placement.

.5 Prevent damage to the pipe during fill placement. Do not permit compaction equipment to come into direct contact with the pipe.

.6 Bring fill and compaction layers up simultaneously and evenly on both sides of the pipe and in firm contact with the haunches of the pipe. Do not allow construction equipment to pass over the pipe until a minimum cover of 600 mm, or greater if necessary to prevent damage to the pipe, of compacted fill has been placed.

.7 Prevent displacement of the pipe during fill placement operations or through floatation.

.8 Maintain the interior of the pipes free of foreign material.

3.4 INSTALLATION TOLERANCES

.1 The installation tolerance from the specified lines, grades, slopes, and elevations is +/-15 mm. Where departures occur that are within the specified tolerance, return to the specified lines, grades, slopes, and elevations at a rate of not more than 5 mm per metre length of the pipe. For greater departures, remove and reinstall the pipe.

.2 Provide a completed pipe installation with a vertical deflection no greater than 3% of the pipe diameter specified in the Contract Documents.

END OF SECTION