

PART 1 GENERAL

- 1.1 Work Performed Under This Section
- .1 Provide the following new services:
 - .1 Domestic water service from the street main to the building, including valves and thrust blocks. Building termination shall be approximately 300mm (12") above the finished floor with a shut-off valve.
 - .2 Sanitary sewer service from the building to the street main, including manholes. Building termination shall be approximately 1200mm (48") outside of the building with a plugged end.
 - .3 Storm drainage system as shown on drawings including manholes and exterior area catch basins.
- 1.2 Quality Assurance
- .1 Qualifications: Execute work of this section by skilled tradesmen regularly employed in the installation of site water supply and drainage services.
- 1.3 Submittals
- .1 Submit shop drawings on hydrants and valves.

PART 2 PRODUCTS AND MATERIALS

- 2.1 Manholes And Catchbasins
- .1 Manholes 900 mm (36") diameter pre-cast concrete. Provide frames and covers in accordance with current local standards. See detail drawings.
 - .2 Catch basins as detailed on the drawings of pre-cast concrete, with grates, frames, and traps conforming to municipal requirements. See detail drawings.
- 2.2 Pipe Restraints
- .1 Joint Restraining Clamps shall be equal to 'EBAA' or 'Robar'.
 - .2 Restraining Devices shall be Stainless Steel, or shall have a minimum of one coat of bituminous material.

PART 3 INSTALLATION AND EXECUTION

- 3.1 General
- .1 Install valves as per manufacturer's requirements.
 - .2 Install piping as per local authorities having jurisdiction.
- 3.2 Pipe Installation
- .1 General: Install straight and parallel, with specified pitch. Use standard fittings for direction changes.
 - .2 Install eccentric reducers in horizontal drainage piping to permit complete drainage.
 - .3 Ream ends of pipes and tubes before installation.
 - .4 Run sanitary and storm drainage with uniform grade.
 - .5 Thoroughly flush and disinfect water supply systems as per municipal requirements.

- .6 Ensure that piping is tested and inspected prior to permanent concealment.
- .7 For all underground pressure sewer piping, well piping, domestic piping, and fire piping, provide concrete thrust blocks as detailed, or provide restraining clamps.
- 3.3 Equipment Installation
 - .1 Install catch basins and manholes in accordance with municipal standards and detail drawings.
- 3.4 Testing
 - .1 Test piping in accordance with the procedures outlined in as required by the Authorities Having Jurisdiction.
- 3.5 Restraining Clamps
 - .1 Restraining Devices shall be Stainless Steel, or shall have a minimum of one coat of bituminous material.

PART 1 GENERAL

- 1.1 References
 - .1 Excavation, backfilling and site grading

PART 2 PRODUCTS

- 2.1 Materials
 - .1 Course filter aggregate: to CSA A23.1-1973, Table 3, Group 1, 19.0 to 4.75mm.
 - .2 Fine filter aggregate: to CAN3-A23.1M77, Table 1.
 - .3 Perforated pipe: 150mm Diameter
 - .4 Solid Pipe: 150mm Diameter ABS
 - .5 Filter Fabric:
 - .1 Synthetic Fibre: Rot proof, unaffected by action of oil or saltwater and not subject to attack by insects or rodents.
 - .2 Fabric: needle punch construction supplied in rolls of minimum 3m width, 20m length and minimum weight of 240g/m².
 - .3 Seams: Welded in accordance with manufacturers recommendations.
 - .4 Physical Properties:
 - .1 Breaking load and elongation: to ASTM D1682-62 (1975) Grab test method 25mm square jaws, constant rate of travel 300mm/min.
 - .1 Stronger principal direction 600N
 - .2 Weaker principal direction 400N
 - .3 Seam strength 90% of tensile.
 - .4 The product of tensile strength times percent elongation at rupture shall be greater than 55 000N%
 - .2 Permeability: 0.10 cmm/s

PART 3 EXECUTION

- 3.1 Inspection
 - .1 Check graded sub-grade for conformity with elevations and cross sections before placing filter bed material.
 - .2 Check for unstable areas and areas requiring additional compaction.
 - .3 Notify Contract Administrator of unsatisfactory conditions.
 - .4 Do not begin installation of foundation drainage until deficiencies have been corrected, unless otherwise directed by Contract Administrator.
- 3.2 Installation
 - .1 Pipe Bedding:
 - .1 Cut trenches in sub-base and place 100 mm thickness of coarse filter aggregate and tamp to grade.

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- .2 Pipe Laying:
 - .1 Wrap pipes in filter cloth.
 - .2 Install plastic pipe and fittings to CGSB41-GP-29M and as shown on drawings.
 - .3 Ensure pipe interior and coupling surfaces are clean before laying.
 - .4 Lay perforated pipe to slope of 10mm per m or as indicated. Face perforations and coupling slots downward.
 - .5 Do not use concrete, masonry, stones, wood, or any type of shim to establish pipe slope.
 - .6 Connect pipes using manufacturers recommended fittings.
 - .7 Protect pipe ends from damage and ingress of foreign material at the end of each work day or work stoppage.
 - .8 Connect pipes to sumps by appropriate adapters manufactured for this purpose.
 - .3 Filter bed backfill:
 - .1 Place filter bed after pipe installation
 - .2 Place 150 mm thickness minimum of coarse filter aggregate on each side of perforated pipe and 300mm of coarse filter aggregate on top of perforated pipe. Place 150mm of fine filter aggregate over top and to the sides coarse filter aggregate.
 - .3 Place filter bed by hand in 150mm lifts. Consolidate by tamping lightly. Prevent displacement of pipe.
 - 3.3 Testing
 - .1 Do not backfill any drain lines until they have been inspected and approved by the City and authorities having jurisdiction. Open test holes shall be left at the high points of drain lines prior to commencement of backfilling. The drain system shall be tested by allowing a continuous flow of water from a hose outlets entering lines at high points. Drainage flow shall be inspected at low points where the lines discharge as indicated on drawings or as directed. If the flow at the discharge points is insufficient, the tile lines shall be inspected and corrected to ensure a proper flow.
 - 3.4 Cleanouts
 - .1 Provide flush cleanouts in all un-perforated pipes immediately inside exterior foundation walls, grade beams, slabs at connections between non-perforated /perforated tile, at all corners and at 15m maximum lengths O.C. along straight runs, unless otherwise indicated.