

PART 1 - GENERAL

- 1.1 RELATED SECTIONS .1 Section 33 05 14: Maintenance holes and catch basins.
- 1.2 MATERIAL CERTIFICATION .1 At least 2 weeks prior to commencing work submit manufacturer's test data and certification that pipe materials meet requirements of this section.
- 1.3 AS BUILT DRAWINGS, OPERATING AND MAINTENANCE DATA .1 Provide as built drawings of sewers in accordance with Section 01 78 00 on project completion. Give details of pipe material, location of cleanouts, directions and list of equipment to operate valves, other maintenance and operating instructions.
- 1.4 SCHEDULING OF WORK .1 Schedule work to minimize interruptions to existing services.
- .2 Maintain existing sewage flows during construction.
- .3 Submit schedule of expected interruptions for approval and adhere to approved schedule.

PART 2 - PRODUCTS

- 2.1 PLASTIC PIPE .1 Gravity sewer pipe and fittings: Type PSM Poly (Vinyl Chloride): to ASTM D3034-08.
- .1 Standard Dimension Ratio (SDR): 28.
- .2 Locked-in gasket and integral bell system.
- .3 Nominal lengths: 4 m.
- 2.2 SERVICE CONNECTIONS .1 Cast iron pipe: to CAN/CSA-B70-06 with rubber gasket push-on joints to ANSI/AWWA C111/A21.11. Fittings: to CAN/CSA-B70-06.
- .2 Cast iron service saddles: with oil resistant gaskets, stainless steel clamp and oil resistant "0" rings in branch end.

2.3 PIPE BEDDING
MATERIALS

- .1 Granular material to following requirements:
 - .1 Crushed or screened stone, gravel or sand free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
 - .2 Granular 'A': to OPSS 1010, April 2004, maximum size 19 mm.
- .2 Concrete required for thrust blocks to be 20 MPa.

2.4 INSULATION

- .1 HI-40 DOW rigid insulation, or approved equivalent, 50 mm thick insulation boards installed as per manufacturer's specifications.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Clean pipes and fittings of debris and water before installation. Inspect materials for defects before installing. Remove defective materials from site.

3.2 TRENCHING AND
BACKFILL

- .1 Carry out trenching work as required to install sewers to lines and grades indicated.
- .2 Do not allow contents of any sewer or sewer connection to flow into trench.
- .3 Trench line require approval prior to placing bedding material and pipe.
- .4 Do not backfill trenches between joints until pipe grade and alignment have been checked and accepted by Departmental Representative. Do not backfill at joints until pressure and leakage test results are within limits specified unless otherwise approved by Departmental Representative. Protect pipe from freezing if tested at temperatures lower than 5 C.
- .5 Remove excess excavated material from the site.
- .6 If cover of 1.5 m is not maintained, insulation must be used.

3.3 INSTALLATION

- .1 Place 150 mm granular bedding materials under piping.
- .2 Shape bed true to grade and to provide continuous, uniform bearing surface for barrel of pipe. Do not use blocks when bedding pipe.
- .3 Shape transverse depressions as required to receive bell if bell and spigot pipe is used.
- .4 Compact full width of bed to at least 95% Standard Proctor density.
- .5 Lay and join pipes in accordance with manufacturer's recommendations.
- .6 Handle pipe carefully with equipment recommended by manufacturer.
- .7 Lay pipes on prepared bed, true to line and grade, with pipe invert smooth and free of sags or high points. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
- .8 Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
- .9 Do not exceed maximum joint deflection recommended by pipe manufacturer.
- .10 Do not allow water to flow through pipe during construction, except as may be permitted by Departmental Representative.
- .11 Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .12 Position and join pipes by approved methods. Do not use excavating equipment to force pipe sections together.
- .13 Install PVC pipe and fittings in accordance with CAN/CSA-B1800 Series-06.
- .14 Pipe jointing:
 - .1 Install gaskets in accordance with manufacturer's recommendations.
 - .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.

3.3 INSTALLATION
(Cont'd)

- .14 (Cont'd)
- .3 Align pipes carefully before joining.
 - .4 Maintain pipe joints free from mud, silt, gravel and other foreign material.
 - .5 Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned and lubricated and replaced before joining is attempted.
 - .6 Complete each joint before laying next length of pipe.
 - .7 Minimize joint deflection after joint has been made to avoid joint damage.
 - .8 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.
- .15 Cut pipes as required for special inserts, fittings or closure pieces in a neat manner, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
- .16 Make watertight connections to maintenance holes. Use non-shrink grout when suitable gaskets are not available.
- .17 Place concrete thrust blocks between bends, tees and fittings and undisturbed ground for forcemain lines. Keep pipe couplings free of concrete.
- .18 Upon completion of pipe laying and after Departmental Representative has inspected pipe joints, place minimum 150 mm granular bedding material around and over top of pipes and compact as for bedding material. Backfill remainder of trench with excavated material.
- .19 Plug service laterals with water tight caps or plugs as approved by Departmental Representative.
- .20 Place location marker at ends of plugged or capped unconnected sewer lines.

3.4 FIELD TESTING

- .1 Test force main in presence of Departmental Representative.
- .2 Brace caps, bends and tees to prevent movement during tests.

3.4 FIELD TESTING
(Cont'd)

- .3 Expel air from main by slowly filling with water. High points to be drilled and tapped and suitable cocks installed to vent air and to be shut when pressure is applied. Remove cocks after satisfactory testing and seal holes with tight fitting plugs.
- .4 Apply hydrostatic test pressure of 690 kPa based on lowest point in line and corrected to elevation of test gauge for hydrostatic test and 345 kPa for leakage test.
- .5 Apply pressures for 1 h for pressure test and 2 h for leakage test.
- .6 Remove defective joints, pipe and fittings where found and replace with new sound material.
- .7 Define leakage as amount of water from source tank in order to maintain test pressure for 2 h. Allowable leakage to be as defined in AMSI/AWWA C600-10.
- .8 Repeat testing until test results fall within accepted allowances.
- .9 Upon the approval of the Departmental Representative CCTV inspection shall be considered an approved alternative to the testing outlined above. Contractor to submit copies of video inspections and reports to Departmental Representative for review and approval.