

PART 1 - GENERAL

1.1 Work Included

- .1 This Section specifies requirements for maintaining services, supplying transporting and installing sanitary gravity sewers with bedding material to the lines, grades and dimensions indicated on the Drawings and as directed by the Departmental Representative.

PART 2 - PRODUCTS

2.1 Pipe and Fittings

- .1 Gasketed type PSM Poly (Vinyl Chloride): to CSA-B182.2 DR35 with minimum pipe stiffness of 317 Kpa.

2.2 Pipe Bedding Material

- .1 Sand bedding material: as specified in Section 31 23 33.01 - Excavating, Trenching and Backfilling.

PART 3 - EXECUTION

3.1 Preparation

- .1 Clean pipes and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects. Remove defective materials from site.
- .2 Provide proper implements, tools and facilities approved by the Departmental Representative, for the safe and convenient prosecution of the work. Take every precaution to prevent foreign material from entering the pipe.

3.2 Trenching and Backfill

- .1 Do trenching and backfill work to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.3 Pipe Bedding

- .1 Place bedding to depth indicated.

- .2 Shape bed true to grade to provide continuous uniform bearing surface for pipe exterior, including spading under the pipe haunches. Do not use blocks when bedding pipe.
- .3 Shape transverse depressions in bedding as required to make joints.
- .4 Carry bedding material horizontally across actual trench width. Mounding bedding material will not be permitted.
- .5 After pipe installation place remainder of bedding in layers over pipe to dimensions indicated.
- .6 Compact each layer of bedding to 95% Standard Proctor Density.

3.4 Pipe Laying

- .1 Carefully lower pipe into the trench. Do not drop or dump materials into trench.
- .2 Firmly and accurately set pipe to line and elevation on bedding material to the depth shown on the drawings, using laser. Install pipe without reverse grade.
- .3 Check profiles at the commencement of work. Confirm grades and depths. Any variation shall be made only at the order of the Departmental Representative.
- .4 Start laying of the pipe at the lowest pipe and lay upgrade unless approved otherwise by the Departmental Representative.
- .5 Do not lay pipe when trench bottom is frozen or underwater or when trench conditions or weather are unsuitable.
- .6 Temporarily support all pipe during assembly in a manner to ensure pipe is not strained during jointing procedure. Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
- .7 Whenever it is necessary to cut pipe to fit into pipeline this work shall be done and materials provided by the Contractor at his own expense. The Contractor will not receive extra compensation for cutting of pipe or for placing cut pipe.

3.5 Pipe Jointing

- .1 Align pipes carefully before jointing.

- .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gaskets and maintain concentricity until gaskets are properly positioned.
- .3 Maintain pipe joints clean and free from foreign materials.
- .4 Complete each joint before laying next length of pipe.
- .5 Apply sufficient pressure in making joints to ensure that
- .6 joint is completed to manufacturer's recommendations. Minimize deflection after joint has been made to avoid damage.

3.6 Frost Insulation

- .1 Provide insulation as detailed on the Drawings in the location indicated or as directed.

3.7 Flushing

- .1 Flush sanitary gravity sewer after installation. Do not flush debris into receiving sewers.
- .2 Flushing operations to be approved and witnessed by Departmental Representative.
- .3 Flush through available outlets until foreign materials have been removed and flushed water is clear.

3.8 Testing - General

- .1 Test all sanitary gravity sewer. All tests to be made in the presence of the Departmental Representative.
- .2 Conduct tests on sections of pipelines as directed by Departmental Representative.
- .3 Provide all labour, equipment and materials required to perform air leakage tests. All equipment used to be approved by the Departmental Representative before use.
- .4 Before testing ensure that all relevant open ends re blanked off with watertight plugs or caps.
- .5 Discharge test water through newly laid pipeline if a suitable outfall exists, or otherwise in accordance with the Contract.

3.9 Testing Sanitary Gravity Sewer

.1 Tests for PVC Sanitary Sewers:

.1 All PVC sanitary sewers including services shall be tested for watertightness by an air test after backfilling.

.2 The test shall be conducted between manhole connection and building service entry.

.3 The test section shall be plugged at each end with one of the plugs equipped for the air inlet. All services, stubs and fittings into the sewer test section shall be properly capped or plugged and braced to prevent leakage.

.4 The air control equipment shall consist of valves and pressure gauges used to control the air entry rate and to

monitor the air pressure. The air Control equipment shall included a shut-off valve, pressure regulating valve, pressure reduction valve and a monitoring pressure gauge having minimum divisions of 69 Kpa and accuracy of .28 KPa.

.5 air shall be supplied to the test section slowly, filling the pipe until a constant pressure of 24 KPa is maintained. The air pressure must be regulated to prevent the pressure inside the pipe from exceeding 34 KPa.

.6 When constant pressure of 24 KPa is reached, throttle the air supply to maintain the internal pressure above 21 KPa for a minimum of 5 minute to permit the temperature of the entering air to equalize with the pipe wall temperature. Check for leakage with a soap solution. If leakage is evident, release the pressure in the line, tighten leaky caps and plugs and repressurize as before.

.7 After a stabilization period, adjust the air pressure to

24 KPa and shut of the air supply. Observe the gauge until the air pressure reaches 20.5 KPa, then commence timing with a stop watch until the pressure drops to 17 KPa. The time required for this pressure loss of 3.5 KPa is:

Pipe Size	Time	100mm	2 min 32 Sec.
125mm	3 min 25 sec.		
150mm	3 min 50 sec.		
200mm	5 min 6 sec.		
250mm	6 min 22 sec.		
300mm	7 min 39 sec.		
375mm	9 min 35 sec.		

3.10 Test to be Repeated

.1 Should tests disclose leakage, pipe having

ponding/reverse grade and/or out-of-roundness is greater than permissible amount, locate and repair defective pipes, or joint, to approval of Departmental Representative.

- .2 Tests to be carried out at Contractor's expense to determine success or otherwise of remedial measures applied to pipework. These tests to be repeated at Contractor's expense until results show that remedial measures have been successful.
- .3 Following acceptance of field test, should Departmental Representative suspect the sanitary gravity sewer, for any reason, no longer complies with requirement of the test, he may order a second test and should the length of pipeline prove defective, Contractor shall repair or make good defect at his own expense.
- .4 Cost of this second test to be borne by Contractor if test proves a defect. However, if this second test shown pipe to be satisfactory, cost of second test will be borne by authority.

3.11 Cleanup

- .1 Upon completion of testing of each section remove all ancillary equipment and plug holes. Do not backfill around test plugs until inspected by Departmental Representative.

END
