

**1.0 GENERAL****1.1 Description**

- .1 This section specifies requirements for constructing building services and appurtenances, to lines, grades and dimensions as directed.

**1.2 Related Work Specified Elsewhere**

- .1 Trenching, Backfilling and Compaction for Utilities Section 02315
- .2 Water Distribution Section 02510
- .3 Sanitary Sewers Section 02537

**1.3 Record Drawings**

- .1 Provide data for record drawings including details of pipe material as well as maintenance and operating instructions.

**1.4 Scheduling of Work**

- .1 Schedule work to minimize interruption of service.

**1.5 Measurement and Payment**

- .1 Machine excavation for building services will be measured in lineal metres for service trenches excavated and backfilled but shall not include installing the pipe.

The unit price for machine excavation shall include the costs for excavation, backfilling and sand bedding.

- .2 Sewer service pipe will be measured in lineal metres installed for the various pipe sizes.

The unit price tendered shall include the cost of supplying, hauling, laying and jointing all pipe and all other work required to install non-insulated sewer service pipe.

Insulated pipe unit price to include the insulated pipe and all the other requirements of non-insulated pipe noted above.

- .3 Sewer pipe fittings shall be measured as each item installed including insulation specified.

- .4 Water service pipe will be measured in lineal metres installed for the various pipe sizes and where applicable include the removal and disposal of the existing water service pipe.

The unit price tendered shall include the cost of supplying, hauling, laying and jointing all pipe and all other work required to install non-insulated water service pipe.

The unit price tendered shall include the cost of supplying, hauling, laying and jointing all pipe, and the pre-insulated duct system and all other work required to install the insulated water service pipe.

- .5 Water service pipe fittings shall be measured as each item installed.
- .6 There will be no separate payment for locating mains for service tie-ins.
- .7 Risers for building services shall be measured in vertical metres from the sewer main invert to the top of the constructed riser, installed as per drawing.
- .8 Boring under future sidewalk and curb locations will be paid for at the unit price tendered for each completed boring required. The tendered price shall include all costs for labour, materials, and equipment required to complete the boring.

## 2.0 **PRODUCTS**

### 2.1 **Sewage Pipe and Fittings**

- .1 Polyvinyl Chloride Pipe: PVC pipe shall be SDR 28 conforming to ASTM D3034. Joints to be rubber ring type. Fittings to be of similar manufacture to the pipe.
- .2 Sewer Pipe Insulation: Insulated sewer service pipe as required by the Engineer or when the cover over the service line is less than 2.0 metres, shall be insulated with expanded polystyrene insulation as follows:
  - .1 The insulation shall have a density of 24 kg/m<sup>3</sup> and the thickness shall be an actual minimum thickness of 50 mm with a compressive strength of 110 kPa;
  - .2 The insulation on pipe and fittings shall be covered with a minimum 1 mm thick HDPE outer jacket.
  - .3 The insulation shall extend to the ends of the bell. Where the bell and spigot ends meet the insulation, it shall be covered with mastic to ensure a waterproof joint exists.

### 2.2 **Water Pipe and Fittings**

- .1 Water Pipe: Pipe for building services shall be High Density Polyethylene Pipe (HDPE), SDR9, Series 200 conforming to AWWA C901. The pipe shall be manufactured in accordance with ASTM D2737-74 and all current revision, using materials designated PE2306, PE3306 or 3406. Joints shall be standard compression type with stainless steel inserts with no alternates.
- .2 Corporation Stops: Shall be standard brass with Mueller tapping thread suitable for compression type connection to piping.

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- .3 Curb Stops: Curb stops shall be standard brass with drain and compression type joints, Mueller Mark II Oriseal valve with drain. The valve casing shall be John East #3063 curb box.
- .4 Thaw Wire: Thaw wire shall be No. 4 AWG bare stranded copper wire.
- .5 Filler Grease: Shall be Grade O Zunicon Light, Food Grade.

**2.3 Pipe Bedding and Backfill Materials**

- .1 Granular Bedding: As per Section 02315
- .2 Common Backfill: As per Section 02315
- .3 Bedding Sand: As per Section 02315
- .4 Bedding Stone: As per Section 02315
- .5 Concrete: As per Section 02315

**3.0 EXECUTION****3.1 Preparation**

- .1 Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects. Remove defective materials from site.

**3.2 Trenching and Backfill**

- .1 Do trenching and backfill work to Section 02315.
- .2 Trench depth to provide minimum cover over sewer pipe to 2.7 m and 3.0 m for water from finished grade.

**3.3 Bedding**

- .1 Bedding shall be Sand Bedding as detailed on drawings and extend to 300 mm above the crown of the pipe.
- .2 Shape bed true to grade to provide continuous uniform bearing surface for pipe exterior. Do not use blocks when bedding pipe.
- .3 Shape transverse depressions as required to make joints.
- .4 Compact full width of bed to at least 95% of maximum dry density.
- .5 Place bedding stone in lieu of sand bedding material when required by the Engineer.
- .6 Fill any excavation below level of specified bedding with bedding stone.

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### 3.4 Sewer Pipe Installation

- .1 Lay pipe to manufacturer's standard instructions and specifications. Do not use blocks.
- .2 Join pipes to manufacturer's recommendations.
- .3 Handle pipe by approved methods.
- .4 Lay pipes on prepared bed, true to line and grade. Ensure barrel of each pipe is in contact with shaped bed throughout its full length. Take up and replace defective pipe. Correct pipe which is not in true alignment or grade or pipe which shows undue settlement after installation.
- .5 The pipe shall be installed in full sections without damage to bell. The pipe shall be terminated outside the right-of-way a distance of 1.0 to 4.0 metres from the property line.
- .6 Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
- .7 Protect installed pipes from ingress or dirt and water or other foreign materials. Whenever work is suspended, install a removable watertight bulkhead at open end of the last pipe laid to prevent entry of foreign materials.
- .8 Position and join pipes with approved equipment. Do not use excavating equipment to force pipe sections together.
- .9 Cut pipes as required for specials, fittings, or closure pieces in a neat manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave a smooth end at right angles to axis of pipe.
- .10 Align pipes carefully before jointing.
- .11 Maintain pipe joints clean and free from foreign materials.
- .12 Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed to be removed, cleaned, lubricated and replaced before jointing is attempted.
- .13 Complete each joint before laying next length of pipe.
- .14 Minimize deflection after joint has been made to avoid damage.
- .15 Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.
- .16 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by Engineer.
- .17 Do not lay pipe on frozen bedding.

- .18 Upon completion of pipe laying surround and cover pipes with approved granular material placed to dimensions indicated or requested.
- .19 Hand place granular material in uniform layers not exceeding 150 mm thick. Dumping of material directly on top of pipe is not permitted.
- .20 Place layers uniformly and simultaneously on each side of pipe to prevent lateral displacement of pipe.
- .21 Compact each layer to at least 95% of maximum dry density.

### 3.5 Water Pipe Installation

- .1 Construct service connections at right angles to water main unless otherwise directed. Locate curb stops 300 mm inside right-of-way.
- .2 Employ only competent workmen equipped with suitable tools to carry out tapping of mains, cutting and flaring of pipes.
- .3 Tap main at 2:00 o'clock or 10:00 o'clock position only, not closer to a joint nor closer to adjacent service connections than recommended by manufacture, or 1 m, whichever is greater.
- .4 Leave corporation stop valves fully open.
- .5 In order to relieve strain on connections, install service pipe in "Goose Neck" form.
- .6 Install curb stop with corporation box on services 50 mm or less in diameter. Set box plumb over stop and adjust top flush with final grade elevation. Leave curb stop valves fully closed.
- .7 Place temporary location markers at ends of plugged or capped disconnected water lines. Each marker to consist of a 38 x 89 mm stake extending from pipe end at pipe level to 600 mm above grade. Paint exposed portion of stake red with designated 'WATER SERVICE LINE' in black.
- .8 Water pipe shall terminate at the same point as the sewer service pipe unless directed otherwise by the Engineer.

### 3.6 Building Service Connections

- .1 The Contractor shall install a water and sewer connection to each of the lots staked by the Engineer.
- .2 The building water and sewer services shall be installed in accordance with drawings and as directed by the Engineer.
- .3 Where building services are laid across recently excavated trenches, particular care shall be given to supporting the pipes. If necessary, backfill material below the pipes shall be re-excavated and backfilled with compaction to ensure that the pipes will not settle.

- .4 All lots shall be serviced with the piping extending from the main to a point 300 mm outside the property line or as requested by the Engineer.

**3.7 Delivery and Stockpiling Materials**

- .1 The Contractor shall be responsible for arranging, stockpiling, and protecting the materials from damage and theft.
- .2 The Contractor shall be responsible for the delivery of material and the Owner will not pay for materials ordered by the Contractor and not used in the work, nor pay for shipping charges on the return of such material to the supplier.

**3.8 Engineer's Access to the Work**

- .1 The Engineer shall be allowed to inspect the work at any time.

**END OF SECTION**