
PART 1 – GENERAL

1.01 DESCRIPTION

- .1 This Section is supplemental to OPSS 410 and shall supersede conflicting specifications within OPSS 410. The requirements of this Section shall be applicable to both gravity sanitary sewers and storm sewers unless noted otherwise.

1.02 RELATED SPECIFICATION

- .1 Construction Specification Section 01450 - Quality Control
- .2 Construction Specification Section 02240 - Dewatering
- .3 Construction Specification Section 02315 - Trenching, Backfilling and Compacting
- .4 Construction Specification Section 02316 - Rock Excavation
- .5 Construction Specification Section 02631 - Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers
- .6 Construction Specification Section 02700 - Site Restoration for Underground Services
- .7 Region of Durham Approved Manufacturer's Products List and Region of Durham Standard Drawings
- .8 OPSS 201 - Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piled Boulders
- .9 OPSS 206 - Construction Specification for Grading
- .10 OPSS 401 - Construction Specification for Trenching, Backfilling and Compaction
- .11 OPSS 410 - Construction Specification for Pipe Sewer Installation in Open Cut
- .12 OPSS 490 - Construction Specification for Site Preparation for Pipelines, Utilities and Associated Structures in Open Cut
- .13 OPSS 492 - Construction Specification for Site Restoration Following Installation of Pipelines, Utilities and Associated Structures in Open Cut

.14 OPSS 801 - Construction Specification for Protection of Trees

1.03 MEASUREMENT FOR PAYMENT

.1 Measurement for risers on service connections will be made along the centreline of the riser pipe from the connection at the main sewer to a point where the service can be measured horizontally, and horizontally from that point to the end of the connection pipe.

1.04 BASIS OF PAYMENT

.1 Unit price bid for main sewer or house service connections shall include all labour, equipment and materials to do the work as specified, including, but not limited to:

- a) All necessary clearing and grubbing.
- b) Excavation to grade and disposal of surplus materials.
- c) Dewatering up to 50,000 L per day unless included in a separate item.
- d) Supporting and protecting existing services unless otherwise noted.
- e) Abandoning of existing sewer pipes in accordance with Contract Drawings including:
 - i) Saw-cutting of existing pipe.
 - ii) Removal and disposal off site of existing pipe.
 - iii) Supply and placement of 15 MPa concrete plug in the ends of the existing pipes that are to be abandoned in place. The minimum length of the concrete plug shall be 300 mm.
- f) Temporary pumping and/or by-pass arrangements required for existing flows, to allow for maintenance hole construction, benching in maintenance holes or sewer replacement to be completed.
- g) Supply and installation of all pipe, fittings, bends, saddles, sleeves, and other appurtenances, complete in the specified bedding and cover.

- h) Connections to existing sewer pipes with proper adapters, sweep bends, couplings (as required).
- i) Connections to existing or proposed maintenance holes, as required.
- j) Substitution of 19 mm Clear Stone Type I in lieu of 19 mm Crusher Run limestone for Class B bedding in wet areas at the Contract Administrator's direction as shown on Region of Durham Standard Drawings.
- k) Supply, placement and compaction of an additional 150 mm depth of 19 mm Clear Stone Type I for Class P bedding in wet areas at the Contract Administrator's direction all as shown on Region of Durham Standard Drawings.
- l) Backfill with select native materials and compaction.
- m) Permanent surface restoration in accordance with Section 02700, Special Provisions and Contract Drawings, unless included in a separate item.
- n) Supply of marker posts and all installation costs where sanitary sewer is located within an easement or open field situation.
- o) Pig tests for all sections of PVC sanitary sewer pipe as specified.
- p) CCTV camera inspection of all new in-place sewer pipe (mains only - services are not included) and all related costs.
Note: On Region of Durham contracts, the CCTV inspection shall be performed by the Region of Durham.
- q) Recording of exact location and elevation of end of completed sewer installation.
- r) Marking and recording of exact location and elevation of all plugged ends of service connection as required. Service connection stubs are not to be backfilled until as-constructed inverts and ties are surveyed by the Contractor's surveyor and approved by the Region of Durham Inspector. The exact locations of all new service connections shall be field confirmed by the Contract Administrator unless specifically dimensioned on the Contract Drawings.
- s) All other work necessary to complete installation of sewer or house service connection pipe as specified.

- .2 Tender quantity for main line sewers will include any adjustment in length within plus or minus 0.3 metres to what is shown on the Contract Drawings. No increase is to be given or deduction taken for adjustments within the 0.3 metre horizontal tolerance. If actual measurement is outside this tolerance, actual measurement will be paid.
- .3 Partial payment may be made for installed but untested or unsatisfactorily tested sewers. Portion of unit price not paid will not be limited to estimated cost of carrying out testing. Factors such as soil conditions, quality of workmanship, depth of sewer and estimated cost of carrying out repairs and making good all related damage shall be taken into account.

PART 2 – PRODUCTS

2.01 MATERIALS

- .1 Reference Region of Durham Approval Manufacturers' Products List on *The Road Authority* web site of www.roadauthority.com
- .2 All sewer and service connection materials shall be in accordance with Contract Drawings and Special Provisions.
- .3 Supply fittings suitable for and compatible with class and type of pipe with which they will be used and connected.

2.02 BEDDING, COVER AND BACKFILL MATERIALS

- .1 Bedding, cover and backfill materials shall be as specified in Section 02315.

PART 3 – EXECUTION

3.01 TRANSPORTING, UNLOADING AND STORING PIPE

- .1 Take delivery of pipes and fittings near to trench. Do not impede traffic.
- .2 Unload pipe using mechanical equipment.
- .3 Place materials in safe storage.
- .4 Do not drop pipe onto ground, rubber tires, or equivalent.

3.02 SITE PREPARATION

- .1 Do site preparation to OPSS 490 unless covered under a separate item.

3.03 TRENCHING AND BACKFILLING

- .1 Do trenching and backfilling to Section 02315.

3.04 PIPE BEDDING

- .1 Place bedding materials as shown on Contract Drawings and Details.
- .2 Keep pipe joints clear of bedding materials to permit jointing. After jointing is completed, place bedding materials as specified.

3.05 INSTALLATION OF PIPES

- .1 The fifth paragraph of Subsection 410.07.12.01 of OPSS 410 is deleted and replaced with the following:

When the Owner raises or lowers the invert of a pipe sewer by 300 mm or less, it will not constitute a Change in the Work and no adjustment will be made to the payment. Where the invert of a pipe sewer is raised or lowered by more than 300 mm, it shall constitute a Change in the Work for the full extent of the change from the original grade.

- .2 Lower pipe into trench carefully by means approved by Contract Administrator.
- .3 Keep trench dry to 1.0 m below invert. Do not lay pipe in water. Reference Section 02240 - Dewatering.

3.06 JOINTING GENERAL

- .1 Keep pipe parallel to previously laid pipe. Sling pipe only at centre.
- .2 Pull or push pipe only by hand or power operated winch. DO NOT USE BACKHOE FOR PUSHING PIPE.
- .3 Prevent joints from opening after pipe has been laid.

3.07 JOINTING CONCRETE PIPE

- .1 Position gasket on spigot of pipe.
 - a) Roll-on gasket: (only on concrete pipe less than 450 mm dia.)
 - i) Position gasket at end of spigot.
 - ii) Do not lubricate.
 - b) Single Offset Gasket:
 - i) Position gasket against support shoulder with fin(s) pointing away from spigot.
 - ii) Equalize tension in gasket.
 - iii) Lubricate top of gasket and inside of bell.
 - c) Confined 'O' Ring Gasket:
 - i) Lubricate groove.
 - ii) Position gasket in groove.
 - iii) Equalize tension in gasket.
 - iii) Lubricate gasket and inside of bell.
- .2 Align pipe ends and enter gasketed spigot straight into bell of receiving pipe.
- .3 Push or pull "home" spigot with pressure evenly and slowly applied straight-on-down centreline of pipe.
- .4 Maintain jointing pressure until cover material is placed and compacted sufficiently to prevent joints from opening.

3.08 JOINTING VITRIFIED CLAY PIPE

- .1 Type 4 Joint:
 - a) Position O-ring in groove in spigot.
 - b) Equalize tension in gasket.
 - c) Lubricate spigot and O-ring.
 - d) Enter spigot firmly into bell.
 - e) Push pipe "home" using pry bar and block assembly.

3.09 JOINTING POLYVINYL CHLORIDE (PVC) PIPE

- .1 Insert gasket in groove of bell end of pipe if gaskets are supplied Polyvinyl Chloride separately.
- .2 Lubricate spigot.
- .3 Insert and push spigot end into bell up to but not beyond depth of stop reference mark.

3.10 JOINTING HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- .1 Push-on joint:
 - a) Insert neoprene "O" ring gasket in groove of Spigot end.
 - b) Lubricate bell of previously laid pipe.
 - c) Align spigot with bell of previously laid pipe so that gasket is in contact with flared bell surface around entire circumference.
 - d) Push pipe "home" by bar and block or manual come-alongs. Push spigot into bell up to but not beyond circumferential depth mark.
DO NOT PUSH PIPE WITH BACKHOE BUCKET.
- .2 Butt Fusion Joint:
 - a) Follow procedures recommended by pipe manufacturer.

3.11 BEDDING AND COVER

- .1 Place bedding and cover materials in accordance with Region of Durham Standard Drawings.

3.12 HOUSE SERVICE CONNECTIONS

- .1 Install house sanitary service connections as shown on Contract Drawings in accordance with Region of Durham Standard Drawings and as directed by Contract Administrator.
- .2 Connection of Foundation Drain Collectors to sanitary sewers is not permitted.

3.13 MARKING AND RECORDING HOUSE SERVICE CONNECTIONS

- .1 Top 100 mm of marker to be painted green for sanitary sewers and red for storm sewers/foundation drain collectors.
- .2 Place painted marker at a point 300 mm above plugged end of service pipe. Marker shall extend to 900 mm above finished grade.
- .3 Do not backfill house service connections until inspected and measurements of locations have been taken by Contract Administrator. Measurements shall include both horizontal ties to nearby structures/landmarks and geodetic elevations. Location measurements must be taken for new and replacement services.

3.14 CLEANING

- .1 Prior to CCTV inspection, clean and flush all new sewer pipes and any existing pipe section where a new pipe is cut in or a pipe is extended. Cleaning and flushing shall be performed using the hydro-jet method.
- .2 Equipment shall be vacuum capable combination hydro-jet cleaner system.
- 3 Contractor shall completely clean out all sediment and debris found in sewer mains to the satisfaction of the Contract Administrator. This process may require more than one pass.
- .4 Contractor shall trap and remove debris found in maintenance holes or any solids or debris accumulated in downstream maintenance hole resulting from the cleaning operation.
- .5 Method of hydro jet cleaning and flushing shall be as follows:
 - a) Starting at high end of sewer system, systematically clean downstream to larger diameter pipe.
 - b) Remove cover from upstream maintenance hole for visual inspection.
 - c) In sections where heavy deposits may be encountered, the Contractor shall place a trap or weir in the outlet side of the maintenance hole to trap debris.

- d) At downstream maintenance hole, engage pump to operating pressure and feed jet head and hose upstream in stages until upstream maintenance hole is reached.
 - e) Pull hose back downstream. Cleaning operation shall be continued until no further debris or sediment is flushed from pipes.
 - f) Replace cover on upstream maintenance hole, disengage pump and remove hose from downstream maintenance hole.
 - g) Remove debris from downstream maintenance hole using vacuum and remove weir or sediment trap. All debris shall be contained and removed from the site to an approved disposal area.
- .6 For new subdivision systems perform low flow simulation after cleaning and flushing and immediately prior to camera inspection by introducing water at high point of completed sanitary sewer system and allowing to flow to low point by gravity. Rectify any ponding areas found during CCTV Inspection as directed by Contract Administrator.

3.15 CCTV INSPECTION

- .1 Do CCTV Inspection to Section 01450

3.16 PVC PIG TEST

- .1 Pig tests will not be required on PVC pipe unless unsatisfactory results are obtained from the CCTV Inspection.
- .2 If the Contract Administrator deems that pigging is necessary after CCTV Inspection, each section of PVC sanitary sewer pipe shall be tested as follows with the passing of an approved test pig from maintenance hole to maintenance hole:

Initial 24 Hour Test by the Contractor

<u>Sewer Size</u>	<u>Pig Size</u>
200 mm dia. PVC Pipe	- 185 mm dia. Pig
250 mm dia. PVC Pipe	- 230 mm dia. Pig
300 mm dia. PVC Pipe	- 274 mm dia. Pig
375 mm dia. PVC Pipe	- 335 mm dia. pig

Ultimate 24 Month Test by the Region

<u>Sewer Size</u>	<u>Pig Size</u>
200 mm dia. PVC Pipe	- 180 mm dia. pig
250 mm dia. PVC Pipe	- 224 mm dia. pig
300 mm dia. PVC Pipe	- 267 mm dia. pig
375 mm dia. PVC Pipe	- 326 mm dia. pig

3.17 MARKER SIGNS

- .1 If a sanitary sewer is located within an easement or open field situation, the Developer/Contractor shall be responsible to place Region of Durham Sanitary Sewer marker signs in accordance with Region of Durham Standard Drawings.
- .2 Marker signs shall be made available to the Developer/Contractor from the Region of Durham at no cost. Marker posts and all installation costs shall be at the Developer's/Contractor's expense. Spacing shall be as shown on the Contract Drawings.

END OF SECTION