Part 1 General

1.1 DESCRIPTION

.1 This item shall consist of the supply and installation of various types and sizes of sanitary sewer pipe as shown on the drawings and/or as ordered all in accordance with this specification.

1.2 RELATED REQUIREMENTS

Section 33 34 00 – On-site Sewage Disposal System

Part 2 Materials

.1 Unless otherwise specified, materials shall be 3rd. party certified to meet the following specifications:

2.1 POLYVINYL CHLORIDE 1120 PIPE AND FITTINGS

.1 CSA Standard B182.2 with a pipe Dimensional Ratio (DR) of 35. The bell will be an integral and homogeneous part of the pipe barrel. The pipe and fittings shall be marked to show the manufacturer, DR and CSA certification.

2.2 JOINTS

.1 Joints for sanitary sewer pipe will be bell and spigot type with a rubber gasket made as recommended by the manufacturer. All sanitary sewer pipe joints must be water tight within the limits set in the item "Sanitary Sewer Leakage Test".

2.3 FLEXIBLE COUPLINGS

.1 Shall be certified to CSA B602.

Part 3 Construction Methods

3.1 MANUFACTUER'S INSTRUCTIONS

.1 All pipe shall be laid and jointed in strict accordance with the manufacturer's instructions. Joints between dissimilar pipes shall be made in accordance with the recommendation of the manufacturer of one or the other of the pipes.

3.2 JOINTING

.1 The pipe, laid with bell-end upgrade, shall be installed so as not to unduly disturb the bedding during jointing. The bell and spigot shall be free of any foreign matter before jointing.

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.2 Where the drawings indicate a new pipe is to be connected to an existing sewer, the Contractor shall supply and install a flexible coupling.

3.3 LAYING

.1 All pipes shall be laid and maintained to the required lines and grades as shown on the drawings or as directed. All pipe laid shall be laid with the use of a laser beam for maintaining grade and alignment. Any pipe which is not in true alignment, or which shows any settlement after laying, shall be taken up and relaid without extra compensation.

.2 PVC pipe shall be installed so that the cross section deflection is less than 7.5%.

3.4 TRACER WIRE

.1 Contractor shall install tracer wire above the new piping to allow ease of future location activities.

3.5 DEFLECTION TESTING

.1 The Departmental Representative, at his discretion, may require the Contractor to complete a deflection test on all sanitary sewer pipes 200mm in diameter or larger which were installed under this Contract. The deflection test is to be run using a rigid ball or mandrel having a diameter equal to 92.5% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices and shall be completed on each section of sewer pipe (manhole to manhole) before installation of the next section commences.

3.6 CLEANING AND VIDEO INSPECTION

.1 The interior of all sanitary sewers shall be cleaned with approved high pressure flushing equipment and 100% video inspected as specified in Section 33031 16 "Sewer Cleaning and Video Inspection".

END OF SECTION

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Part 1 General

1.1 DESCRIPTION

.1 This item shall consist of the cleaning and video inspection of all new sanitary sewer pipe between the existing sanitary manhole and new distribution box. Cleaning shall be done with approved high pressure flushing equipment. Cleaning and video inspection shall be done as soon as all laterals and structures are installed.

.2 Cleaning and video inspection shall also be completed on existing sanitary sewer gravity pipe exiting the Fish Hatchery Facility building which flows into the existing sanitary manhole and newly constructed septic system. Completion of this portion of video inspection shall be completed prior to construction of the septic system.

Part 2 Materials

.1 The Contractor shall supply all approved materials necessary to successfully complete the cleaning and video operations.

Part 3 Methods

3.1 VIDEO INSPECTION

.1 The sewers shall be inspected using a closed circuit television camera. The maximum speed of the television camera through the pipe shall be 0.30 metres per second with a 5 second minimum stop at each defective location and a 15 second stop at each lateral.

.2 The inspection shall be recorded on a DVD format, or other format acceptable to the Department Representative. The audio part shall include the recording of distances at a maximum interval of three meters and a brief description of every defective location and of each lateral. A photograph shall be taken at each defective location. The photograph and the distance the photograph was taken at shall be placed in a report to the Departmental Representative.

.3 Two copies of the complete record of the inspection and original DVD or digital file shall be the property of the Departmental Representative.

3.2 CLEANING

.1 Should the video inspection disclose defective work, the Contractor shall, at his own expense, repair the defective work to the satisfaction of the Departmental Representative. The defective section shall be video inspected after repairs are completed at the Contractor's expense.

END OF SECTION

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Part 1 General

1.1 DESCRIPTION

.1 This Section specifies requirements for the supply, delivery, installation, and commissioning of a complete conventional domestic septic system including:

- .1 Septic tank
- .2 Distribution box
- .3 Discharge field
- .4 Interconnecting piping

1.2 QUALIFICATIONS

.1 The Contractor, or their Sub-Contractor, shall be licensed by the Province of New Brunswick, and have an approval to install conventional on-site sewage disposal systems in the Province of New Brunswick.

1.3 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedure.
- .2 Section 01 45 00 – Quality Control.
- .3 Section 01 91 33 – Commissioning Form
- .4 Section 31 23 17 – Granular Borrow (Pipe and Structures)

1.4 SUBMITTALS

.1 Submit shop drawings for approval in accordance with the requirements herein.

.2 Include with Shop Drawings the following:

- .1 Drawings of septic tank, including dimensions, capacities and weights
- .2 Calculation showing that the weight of the septic tank will overcome buoyancy forces related to complete submersion when empty.
- .3 Confirmation septic tank complies with CSA B66
- .4 Septic tank effluent filter manufacturer and model number
- .5 Drawings of distribution box, including dimensions, capacities and weights
- .6 Calculation showing that the weight of the distribution box will overcome buoyancy forces related to complete submersion when empty.
- .7 Tank Hatches drawings, manufacturer, and model number

.3 All dimensions and other units are to be metric.

1.5 GUARANTEES

.1 The Supplier shall provide a one year warranty for the on-site sewage disposal system provided herein.

1.6 STANDARDS

.1 Comply with the latest edition of the applicable Provincial guidelines including, but not limited to, the following:

.1 New Brunswick Technical Guidelines for On-site Sewage Disposal Systems
.2 New Brunswick Public Health Act
.3 New Brunswick Clean Water Act
.4 Canadian Standards Association (CSA).
.5 American Society for Testing and Materials (ASTM).
.6 American National Standard Institute (ANSI).
.7 All references to be latest revision.
.8 In case of any conflict between these specifications and any of the above standards, the most stringent requirement will have precedence.

Part 2 Materials

2.1 GENERAL

.1 A new septic treatment system shall be supplied and installed by the Contractor, to treat domestic sewage at the Mactaquac Fish Hatchery facility, as specified herein.

.2 The on-site sewage disposal system shall consist of a new septic tank, distribution box, conventional buried discharge field, buried interconnecting piping, excavation and backfill, import of backfill materials, disposal of waste materials, and site restoration, as specified herein.

2.2 DESIGN CRITERIA

.1 Design the septic treatment system for the following conditions:

.1 Service: Raw domestic sewage
.2 Facility Type: Industrial building without showers
.3 Daily Sewage Flow: 105 Litres/employee/day
  .1 Base load: 75 L/day/employee
  .2 Kitchen Load: 10 L/day/employee
  .3 Lab sinks: 20 L/day/employee
.4 Peaking factor: 30 percent
.5 Staff count: 25 people

.6 Design Sewage Rate: 3400 Litres/day

2.3 PREFABRICATED SEPTIC TANK

.1 The prefabricated concrete septic tank shall conform to the following:

.1 Be constructed from concrete.

.2 Weight of the empty tank shall counteract buoyancy forces when the tank is completely submerged in water.

.3 Must be stamped in accordance to CSA B66

.4 Have a minimum liquid capacity of 3410L.

.5 Be constructed with two compartments, where the liquid capacity of the first compartment is equal to two-thirds of the total septic tank capacity.

.6 Be constructed with baffles at the inlet and outlet ends.

.7 Be water-tight

.8 Be located below grade. To ensure that the tank is accessible for septage removal, service, and maintenance, an access shall be provided to each compartment with openings above grade.

.9 Be equipped with an effluent filter meeting NSF Standard 46 that easily accessible for maintenance. The filter shall be equipped with a handle that extends to within 150 mm of the access riser rim. The handle should be of such a material that allows easy removal and replacement.

.10 Ensure that all access openings have a lockable secure hatch cover. Hatch covers shall be constructed of corrosion resistant material.

.11 Hatches shall be sized to allow worker entry

.12 Be insulated for frost protection to a depth not less than 1.5 metres

.13 Ensure that all piping connections are watertight and not allow groundwater and surface water infiltration or wastewater leakage.

.14 Minimum working capacity of 6136 Litres

.2 Spare Parts

.1 Effluent Filters: Quantity two (2)

2.4 DISTRIBUTION BOX

.1 The prefabricated distribution box shall conform to the following:

.1 Constructed from concrete

.2 Weight of the empty box shall counteract buoyancy forces when the box is completely submerged in water.

.3 Ensure equal distribution of sewage into the disposal field

.4 Be water-tight

.5 Consist of one inlet hole and the required number of outlet holes

.6 Installed level

.7 Constructed to prevent short circuiting. A baffle should be installed in front of the inlet.

.8 Provide adjustable flow equalizers

.9 Be insulated for frost protection to a depth not less than 1.5 metres

.10 Be located below grade. To ensure that the distribution box is accessible for septage removal, service, and maintenance, access shall be provided with openings above grade, that provides access to all areas of the box.

.11 Ensure that all access openings have a lockable secure hatch.

.12 Hatch covers shall be constructed of corrosion resistant material.

.13 Hatches shall be sized to allow worker entry to adjust flow equalizers.

.14 Ensure that all piping connections are watertight and not allow groundwater and surface water infiltration or wastewater leakage.

2.5 DISPOSAL FIELD

.1 Perforated Distribution Pipe

.1 The perforated distribution pipe shall conform to the following:

.1 Sized: 102 mm (4 inch) diameter

.2 Meet CAN/SCA Standards B181.1, B181.2, B182.1 and B182.2.

.3 Ends of distribution lines must be capped.

.2 Trench Construction

.1 The trench shall confirm to following requirements:

.1 Minimum trench width: 450mm

.2 Maximum trench width: 900mm

.3 Maximum trench depth: 900mm

.4 Maximum trench length: 15m

.5 Trench separation (centers): 1.5m

.6 Minimum total length of perforated pipe: 60m

.7 Depth of screened crushed stone under pipe: 200mm

.8 Depth of screened crushed stone over pipe: 50mm

.9 Slope of perforated pipe: 50mm per 15m (0.33%)

.2 Screened crushed rock shall be used both under and to cover the perforated pipe. The crushed rock shall be screened from 10-50mm.

.3 The Trench shall be backfilled to the following requirements:

.1 Geotextile shall be placed over the crush stone before backfilling.

.2 The trench shall be filled above the geotextile with a sandy loam soil. Provide a minimum 300mm/maximum 600mm layer of sandy loam.

.3 Overfill trench to allow for settling.

.4 Provide a cover of topsoil of at least 100mm that is able to support vegetation.

.5 Apply hydroseed and hay mulch to the topsoil.

.3 Swale Construction

.1 The landscaped swale shall confirm to the following requirements:

.1 Minimum Width: 600mm

.2 Minimum Depth: 300mm

.3 Be finished with 100mm topsoil, hydroseed and hay mulch

.4 Promote drainage away from the disposal field along the alignment shown in the contract drawings or as directed by the Department Representative.

Part 3 Construction Methods

3.1 APPLICATION

.1 The Contractor shall complete and submit an application for the conventional on-site sewage disposal system, as specified herein, to the Department of Public Safety, Technical Inspection Services, per the requirements of the New Brunswick Technical Guidelines for On-site Sewage Disposal Systems.

.2 The Contractor shall be responsible for all fees associated with the application process.

3.2 TEST PITS

.1 The Contractor shall excavate two (2) test pits as noted in the drawings. The test pits shall remain open until the application is approved by the Department of Public Safety, Technical Inspection Services.

.2 Depth of test pits shall take into consideration the proposed final grade elevation for the disposal field.

.1 Depth of test pits shall be 2.7m based on existing surface elevations.

.3 The Contractor shall evaluate the soil classification based on test pit samples below the elevation of the disposal field lateral piping inverts. The Contractor shall submit his evaluation of the soil conditions to the Departmental Representative with 24 hours of test pit excavation.

.4 The Departmental Representative reserves the right to collect and conduct third party soil analyses prior to the Contractor submitting soil classification information in the Application. The Contractor shall request written permission from the Departmental Representative to submit their test pit soil evaluation with the Application.

.5 Contractor shall provide temporary fencing or similar barrier around the perimeter of open test pits.

.6 Contractor shall be required to confirm the presence of buried utilities prior to all site excavations.

3.3 DELIVERY

.1 Protect all components during transport and for handling.

.2 Any components damaged during shipment shall be removed from the site and replaced with new, identical, undamaged components, or repaired subject to the approval of the Departmental Representative.

.3 Notify the Departmental Representative in writing at least seven (7) days in advance as to when equipment is to be delivered to the site.

3.4 INSTALLATION

.1 Install in accordance with New Brunswick Technical Guidelines for On-site Sewage Disposal Systems (latest version) and other applicable standards listed in 1.6.1 Standards

.2 Pending results of the soil classification, the size of the disposal field may be reduced to suit conditions of the site. Contractor will be compensated based on actual measurements of appurtenances, fittings, pipes and structures installed based on contract unit rates. Reduction of disposal field size will be at the discretion of the Departmental Representative.

.3 Provide appurtenances, fittings, connecting piping, supports, accessories, concrete and grout not specified herein or elsewhere specifically mentioned or included but necessary for the installation, operation and testing of the equipment, without additional payment.

.4 After the equipment has been installed and prior to final acceptance, protect the equipment from damage. Ensure that protection measures are to the satisfaction of the Departmental Representative.

3.5 COMMISSIONING

.1 The Contractor shall demonstrate to the Department representative that the distribution box has been installed level, and that the flow equalizers are adjusted to provide balanced flow to all discharges.

END OF SECTION