PART 1 – GENERAL

1.1 Description and Instructions

.1 This section refers to the supply and installation of a complete in-ground sewage disposal system (septic tank and absorption bed) for the Tuchitua Grader Station and related work.

.2 All work shall be carried out in such a manner that disruption to the facility and staff is minimized.

.3 Submit a work plan and schedule to the Owner and Engineer for approval prior to commencing work.

.4 The Contractor will be responsible for obtaining a permit to install the septic system from Environmental Health Services.

PART 2 – PRODUCTS

2.1 Materials

.1 Unperforated pipe: PVC to CAN3-182.1-M1983 (DR35), 100 dia.

.2 Perforated pipe: 100 dia. PVC to CAN3-182.1, having 2 rows of 13 mm dia. holes positioned 120° radially on the pipe, spaced to provide minimum total cross-sectional hole area of 5,800 mm² per standard length of pipe. One additional 13 mm hole to be drilled through the bottom of each pipe length or about every 3 m.

.3 Fittings: All tees, elbows, cups, long sweep elbows, connectors to be PVC, and compatible with piping.

.4 Drain Rock and Filter Sand shall have the following gradation limits:

Filter Sand		Drain Rock	
Sieve Size (mm)	% Fines (By Weight)	Sieve Size (mm)	% Fines (By Weight)
4.75	100	65	100
2.00	75 – 100	20	0 – 100
0.25	5 – 75	4.75	0 – 5
0.08	0 – 15	0.08	0 – 3

.5 Filter Fabric: Acceptable products are Polyfelt TS200, 2 mm thick, by Nilos Canada Ltd., Texel Geotextile, 2.6 mm thick by Texel Inc.

.6 Board Insulation: Styrofoam, extruded polystyrene, 50 mm thick, shiplap edges, RSI 0.87 (R10).
Compressive strength: 210 kPa (30 psi) min.
Water absorption: 0.7% max. by volume.

.7 Pipe Insulation (as required): Rigid urethane foam, factory applied, min. thickness 50 mm with heat trace channel. All pipe insulation shall be coated with an outer polyethylene jacket (factory applied or by approved tape wrap method).

.8 Heat Trace (as required): 5 watts/metre complete with electrical thermostatic control.

.9 Septic Tanks and Siphons:
- .1 Insulated Septic Tank: as indicated and meeting CAN/CSA-B66-00 standards. Working capacity: 2,747 litres (3,409 litres min. total rated capacity including siphon).
- .2 Siphon: To meet materials standards as described in CAN/ CSA-B66-00.
- .3 Cleanouts: 100 x 100 x 100 PVC lateral wye and exterior above-ground surface with cap.

.10 Septic tank and siphons shall be insulated by the supplier prior to delivery to site.
- .1 Insulation shall be factory-applied, rigid polyurethane foam insulation of 50 mm minimum thickness to ASTM D1622 not less than 40 kg/m³ density.
- .2 Closed cell content (ASTM D2856) not less than 90%.
- .3 Water absorption not greater than 16 kg/m³.
- .4 Thermal conductivity (ASTM D2326) not greater than 0.0187 W/m°C at 25°C.
- .5 Dimensional stability (ASTM D2126) 3%.
- .6 Comprehensive strength (ASTM D2126) not less than 264 kPa parallel to rise and 210 kPa perpendicular to rise at 10% strain.

.11 Provide shop drawings of the septic tank, siphon and heat tracing system with controls to the Engineer for review prior to delivery.

PART 3 – EXECUTION

3.1 Site Preparation

.1 The exact location of the septic tank and absorption bed shall be approved by the Engineer.

.2 Excavate, remove and dispose of existing sewage disposal system.

.3 Obtain approval from the Engineer for the exposed surface which will be the receiving soil for the new absorption bed.

3.2 Percolation Test

.1 The Contractor shall conduct a percolation test in the receiving soils of the bed following Environmental Health Services Guidelines.

.2 In addition to the percolation test, the Contractor shall make an excavation to 3 m in depth to investigate for possible bedrock or groundwater. Contact the Engineer for inspection prior to backfilling. If groundwater is encountered within 1.2 m of the bottom of the bed, the depth of cover over the bed may have to be adjusted in order that 1.2 m clearance is provided.

.3 The percolation tests are required to confirm that the system design will be satisfactory for the soils type encountered.

.4 Provide the percolation test results to the Owner and Engineer for review. If the test indicates that the percolation rate is slower than 5 minutes/ 25 mm, then the bed design will be adjusted by the Engineer to suit the soils type.

.5 If a design modification is required, an extra (or credit) may be negotiated with the Owner.

3.3 Pipe Installation

.1 Construct in accordance with details, true to alignment and grade.

.2 Make connection to existing drain line from building.

.3 Grade pipe as laid out and specified. Maintain pipe elevations within 5 mm of grades indicated.

.4 All perforated piping to be laid level.

.5 All joints in solid piping to be solvent welded, unless otherwise directed by the Engineer.

.6 All perforated pipe to be laid with perforations pointing downward.

.7 All solid piping to septic tanks, and from tanks to header pipe in beds, shall be laid at 2.0% grade minimum.

.8 All other piping within the in-ground system shall be laid exactly level.

.9 All buried solid piping shall be sand-bedded with a minimum of 150 mm below the pipe and 300 mm above the pipe. Minimum bottom trench width: 600 mm.

.10 Flexible couplers shall be used to connect piping at the inlet and outlet of the septic tank.

.11 All trench and backfill materials shall be compacted to a minimum 95% SPMDD.

.12 Backfill over the absorption bed and surrounding area with approved fill material and grade such that surface run-off will drain away from the bed on all sides.

.13 Install heat trace system and control system in accordance with manufactures instructions and Electrical Code of Canada.

3.4 Septic Tank

.1 The septic tank and siphon shall be bedded in compacted sand with minimum 150 mm beneath the tanks, 150 mm above the tanks and 300 mm on all sides. Minimum cover over tank: 1.2 m.

.2 The septic tank and siphon shall be certified for the depth of bury intended.

3.5 Cleanup

.1 Restore area around the septic tank to original condition after installation.

.2 Grade smooth all areas which have been disrupted by trenching and the absorption bed to the satisfaction of the Owner.

3.6 Inspections and Documentation

.1 The Engineer and Owner must be notified for inspection and approval at the following stages.

- Septic tank bedded, prior to backfilling.
- All solid pipe trenching, prior to backfilling.
- Absorption bed after placement of filter sand.
- Absorption bed after placement of drainrock and perforated piping, but prior to covering the piping.
- Absorption bed after placement of geotextile, just prior to start of backfilling.
- At completion of backfilling.

.2 Provide a photo documentation of the septic system installation to the Owner and Engineer within 15 days of completion of the Work. The documentation shall be in accordance with the Photographs Checklist as required by Environmental Health Services, Health and Social Services, Yukon Government.

END