

1.12 Codes and Standards

- .1 Design and construction must follow best practices of the professions, manufacturers and trades involved, and meet or exceed the requirements of the:
 - .1 National Building Code
 - .2 Canadian Plumbing Code
 - .3 Canadian General Standards Board
 - .4 Canadian Standards Association
 - .5 American Society for Testing and Materials
 - .6 American Society of Mechanical Engineers
 - .7 American Gear Manufacturers Association
 - .8 Electrical and Electric Manufacturers Association of Canada
 - .9 Canadian Electrical Manufacturers Association
 - .10 National Electrical Manufacturers Association
 - .11 American National Standards Institute
 - .12 Hydraulics Institute
 - .13 Transportation Association of Canada
- .2 In case of a conflict or discrepancy between the contract documents and the governing codes and standards, the more stringent requirements apply.
- .3 Unless otherwise specified, the latest editions published by the issuing authority, current at the date of the contract document execution, shall apply.

PART 2 - PRODUCTS

2.1 Intent

- .1 This section stipulates the minimum functional requirements for the design, supply and commissioning of the sewage treatment plant.
- .2 It is the intent that the tenderer will incorporate the minimum required functions described in this section into a complete process design. The tenderer is required to supplement these minimum requirements as necessary to develop a fully operational facility and to design, test, commission and warranty the treatment processes.

2.2 General Design Requirements

- .1 Provide equipment arrangements so that working parts are readily accessible for inspection, maintenance, repair or replacement.
- .2 Design process so that, in event of freeze-up, entire system can be drained quickly and in the easiest manner possible.
- .3 Do not use gaskets containing asbestos.
- .4 Provide high efficiency motors. Motors 0.375 kW and above shall be 575 V/3 phase/60 Hz motors less than 0.375 kW shall be 120 V/1 phase/60 Hz. It is the responsibility of the tenderer to ensure that all equipment meets the requirements of the electrical code for installation inside of an enclosed building.
- .5 **All treatment units shall be suitable for enclosure within a building and covered as required.**
- .6 All tanks to be above ground and suitably designed for stand alone structure for fill and empty conditions.
- .7 Provide material and equipment meeting specified performance and for which replacement parts are readily available.

2.3 Raw Sewage Handling

- .1 Trucked delivery to treatment plant 5 days per week.
- .2 Capacity of largest sewage truck 10 m³.
- .3 Gravity discharge from truck to treatment plant receiving tank.
- .4 Receiving tank enclosed and vented to outdoors.
- .5 Capacity of receiving tank minimum 150% of largest tank.

2.4 Primary Screening

- .1 Pumped for controlled throughput.
- .2 Coarse rotating drum screen or equivalent.
- .3 Automatic solids removal and recovery.

- .4 Solids recovery suitable for direct disposal to landfill.
- .5 Nominal 12mm openings for coarse solids removal.

2.5 Flow Equalization

- .1 Single, continuously aerated tank.
- .2 Tank enclosed and vented to outdoors.
- .3 Coarse bubble aeration through fixed diffusers.

2.6 Biological Treatment

- .1 100% redundant dual train reactors.
- .2 Each reactor sized to accommodate 100% normal flow during upset events or maintenance (1 tank out of service).
- .3 Direct gravity piped discharge to receiving environment.
- .4 **Sized for guaranteed discharge quality at 20 year design flows not exceeding limits specified in Section 1.8.3.**
- .5 Provide access to all areas of the treatment units.
- .6 Configure units to facilitate cleaning and servicing.
- .7 Provide aeration as required.
- .8 Configure piping to minimize clogging and to facilitate cleaning and flushing.
- .9 Successful tenderer shall be responsible for the supply, storage and establishment of all required plant and animal organisms used in the treatment process.

2.7 Sludge Handling

- .1 Single, continuously aerated tank.
- .2 Coarse bubble aeration through fixed diffusers.
- .3 Minimum 40% reduction in volatile solids at 20 year design flows.
- .4 Solids retention time sized to meet volatile solids reduction criteria.
- .5 Variable level decant returned to flow equalization.
- .6 Thickened sludge pumped discharge to existing ex-filtration lagoon either direct or via truck.

2.8 Pumps and Blowers

- .1 Provide 100% standby to all rotary equipment (i.e., blowers, pumps).
- .2 All units to have 100% redundancy.
- .3 Blowers shall be positive displacement, belt driven with electric motor and belt guards.
- .4 Blowers to run at 1800 rpm, maximum.

2.9 Flow Measurement

- .1 Flow measurement to be provided on both influent and effluent streams.
- .2 Flow measurement system shall have a display unit to show the instantaneous rate of flow through the sewage treatment plant in Litres per minute and the totalizer read out.

2.10 Electrical and Controls

- .1 General
 - .1 All major equipment shall be provided with its own control panel.
 - .2 All control panels must have terminals for discrete digital input/outputs or analog input/outputs, as required, for connection to SCADA system by others. Contacts shall be provided for each alarm

- condition, operating status, elapsed time meter and ammeter, as required.
- .3 interconnecting wiring of systems and controls is performed by others.
 - .4 All alarms shall have manual reset.
 - .5 Control panels shall have motor starters and H-O-A switches, as required. All switches to be 1 pole switch, common grounds not acceptable.
 - .6 Electrical equipment shall have local disconnect, as per Electrical Code requirements.
 - .7 Provide electrical sub-station, as required.
- .2 Screen Panel Requirements
- .1 Alarms (minimum) and classification
 - .1 Motor overload - low priority
 - .2 Screen blinding/High Level - high priority
- .3 Aeration Blower Panel Requirements
- .1 Automatic switchover relay(s) on overload or high temperature.
 - .2 Non-resetable running hour meters, one for each blower.
 - .3 Alarms (minimum) and classification:
 - .1 Motor overload - Low Priority
 - .2 High temperature - Medium Priority
- .4 Pump Panel Requirements (if required)
- .1 Automatic switchover relay(s) on overload or seal leak.
 - .2 Non-resetable running hour meters, one for each pump.
 - .3 Alternating relays.
 - .4 Floats for pump control, including lead on, lag on pump off.
 - .5 Alarms (minimum) and classification:

- .1 High level - High Priority
- .2 Low level - Low Priority
- .3 Pump overload - Low Priority
- .4 Pump seal leak - Low Priority
- .5 Flow monitoring equipment shall have the output capability to send the flow signal to SCADA system in addition to local indicator.

2.11 Plant Piping

- .1 Clearly identify and label all plant piping to indicate liquid and direction of flow.
- .2 All piping shall be securely fastened.
- .3 Plant piping shall be suitably coated galvanized steel or ductile iron.

PART 3 - EXECUTION

3.1 Start-up and Commissioning

- .1 Successful tenderer shall be responsible for all start-up and commissioning requirements.
- .2 Cape Dorset operator will be on-site for training.

3.2 Operation of Treatment Facility

- .1 Cape Dorset will not take over the operation of the plant until satisfactory performance is achieved.
- .2 Operations to be performed include:
 - .1 Training Cape Dorset operator.
 - .2 Collecting and analyzing influent and effluent samples according to Nunavut Water Board requirements, as well as any other sampling analyses to optimize treatment.

- .3 Maintenance and inspection of all equipment.
- .4 Logging all pertinent operating data, results and observations.

3.3 Performance

- .1 **The effluent quality requirements described in Section 1.8.3 shall be considered to be adhered to if:**
 - .1 80% of the BOD and SS test results are equal to or less than 20 mg/L.
 - .2 No single BOD or SS test result exceed 40 mg/L each.
 - .3 Sampling frequency for performance requirement shall be stipulated frequency as stated in Water Licence.
 - .4 The Tenderer may be required to post a performance bond as part of contract negotiations.

*** END OF SECTION 15000 ***

Appendix F
SBR Suppliers
Floor Layouts and Process Diagrams