

NOMADIC™ Mobile Sewage Treatment

General Specifications for Attached Growth Biological Reactor Models

General

The NOMADIC™ Attached Growth Biological Reactor model system shall consist of:

1. a modified cargo shipping container or multiple containers
2. an epoxy coated, multi-chamber steel tank,
3. high strength aeration system,
4. settling,
5. Attached Growth Biological Reactor wastewater treatment system,
6. an ultra-violet light disinfection system,
7. an activated sludge return system and
8. a effluent discharge systems.

Cargo Container

The cargo shipping container shall be modified for man door access for maintenance personnel, service access hatches on the top of the container, and openings for fresh air inlet, sewage inlet, electrical conduit inlet and final effluent discharge.

The cargo container shall be fitted with steel skid plates, roll on / roll off bars and protective bollards. The container shall be re-painted in forest green colour or other colour as requested by the buyer.

The container shall be insulated and heated.

Operating Conditions

Each model number shall state the maximum number of persons that the system as designed to treat for the industrial / work camp.

Each person shall generate or contribute to not more than 227.3 litres of wastewater per day. The influent wastewater shall not have a combined sewage strength not exceeding a BOD5 of 650 mg/l, TSS of 350 mg/l, Fats, oils and greases of 35 mg/l and have a pH of 6.5 to 7.5 at all times.

Fats, oils and grease source control are solely the responsibility of the user of the NOMADIC™ mobile wastewater treatment system to ensure that the level of as set down above is not exceeded.

Flow Equalization system to be supplied by others for the raw sewage wastewater entering into the NOMADIC™ is recommended to be in accordance with the following:

- a. Volume per dose is not to exceed 7 ½ % of the total daily design flow
- b. Rest period per dose is not to be less than 15 minutes
- c. Volume per minute is not to exceed the allow limit of the ultra-violet light system

The effluent quality from the NOMADIC™ mobile wastewater treatment system™ shall have a BOD5 of < 20 mg/l, TSS of < 20 mg/l, Fecal Coliform of < 200 CFU/100 ml and a pH of 6.5 to 7.5

Multi-Chamber Steel Tank

The steel tank shall be coated inside and outside, including all internal steel pipe works, with an epoxy coating that has a ten (10) year warranty suitable for use in a sewage wastewater vessel.

Each of the steel tank's chambers shall have a volumetric working capacity in accordance with the requirements as determined by Pinnacle Environmental Technologies Inc. for the corresponding NOMADIC™ model for the respective daily design flow rate.

Chambers used for aeration, settling or the AGRB treatment shall be directly exhaust vented to the exterior of the cargo container. A chamber of a steel tank in each of the cargo containers shall hold the

either a discharge pump or an ultra-violet light disinfection system and, shall not be enclosed unless a sealed hatch cover is placed directly over the disinfection unit and discharge pumps.

Each chamber of the steel tank shall have a 100 mm diameter drain pipe connected to a brass knife/gate valve placed on the exterior of the steel tank complete with cam-lock fitting.

High Strength Aeration System

The high strength aeration system shall be supplied by Pinnacle Environmental Technologies Inc. and shall have the volume of air and chamber capacity to be in accordance with the requirements of Pinnacle Environmental Technologies Inc. in order to reduce the BOD5 down to between 250 and 350 mg/l prior to the settling chamber.

The chamber shall be fitted with an inlet dispersal system and a baffled outlet. Outlet baffle shall be at least 1.8 metres distance from the inlet to flow, by gravity, the wastewater into the settling chamber.

The aeration system's air blowers shall be the regenerative style and shall be approved by Pinnacle Environmental Technologies Inc. The air blowers shall be controlled by a central control panel that shall have a switch for each air blower that shall turn the air blower "Off" or "On"

Settling Chamber

The settling chamber shall have a volumetric capacity of not less than one day of the daily design sewage flow and shall be fitted with outlet baffle to flow by gravity into the AGBR chamber.

Attached Growth Biological Reactor (AGBR)

The attached growth biological reactor shall be a submersed self-cleaning plastic media with an airlift assembly or multiple airlift assemblies encased in a plastic liner.

The attached growth biological reactor shall be accredited under the National Standard of Canada system and the Standards Council of Canada or the American National Standards Institute as meeting either of the NSF International Standard 40, Class 1 or the CAN/BNQ 3680.

The AGBR shall be one of MicroFAST® or HighStrengthFAST® as solely available from Pinnacle Environmental Technologies Inc. in Langley, British Columbia.

The AGBR shall be supplied and installed by Pinnacle Environmental Technologies Inc. into the NOMADIC™ system.

The AGBR chamber shall have a volumetric capacity in accordance with the requirements as determined by Pinnacle Environmental Technologies Inc. for the corresponding daily design flow rate for the respective NOMADIC™ systems.

Ultra-Violet Light Disinfection

An ultra-violet light for disinfection shall be the PROTECTOR™ as available from and installed by Pinnacle Environmental Technologies Inc. and shall have a control panel to notify by a audible and light alarm when a UV lamp is not operating.

The disinfection system shall have a "P" trap assembly to stop any transfer of gases or odours from the previous chambers entering into the chamber holding the UV system.

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Activated Sludge Return Process

An activated sludge return process shall be in accordance with the specifications of Pinnacle Environmental Technologies Inc. and shall be installed by them.

There shall be a series of perforated pipes placed under the AGBR unit and connected to a trash sludge pump that sends the sludge on a time controlled basis to the aeration chamber.

The trash sludge pump shall be controlled by a panel that contains a changeable timer and an audible and visual alarm.

Effluent Discharge System

All effluent discharge system shall be an on-demand duplex alternating ½ HP, 2" solids handling pumps with liquid level sensors for pump on, pump off and high level alarm.

A pump controller shall be installed in accordance with the requirements of Pinnacle Environmental Technologies Inc. and shall have event recording capabilities to determine actual daily flow rates.

Redundancies (a.k.a. back up)

Liquid handling pumps shall be duplex with alternating frequencies as controlled by the pump controller,

Each cargo container's air blowers shall have a spare or redundant blower installed and connected through pipe and valve system to be activated manually.

Ultra-Violet Light shall have redundant capacity.

Spare parts shall be requested as determined by the buyer.

Electrical

The NOMADIC™ mobile wastewater treatment system shall be, at the Pinnacle factory, electrically wired by a Licensed Electrical Contractor who holds a "red seal" accreditation for Canada.

Electrical work to be conducted by a qualified electrician at the location of the placement of the NOMADIC™ mobile treatment system shall be responsible for any electrical permits or compliance to local codes, bylaws or legislation in regards to connection and use of the NOMADIC™ system.

Warranty

The AGBR, all air blowers and controls are warranted against defects in material or workmanship for one (1) year from date of shipping from the factory.

The steel tank is warranted against defects in material or workmanship for one (1) year from date of shipping from the factory.

The coating on the steel tank is warranted for ten (10) years from date of shipping from the factory.

Cargo Container is a one-time used container and has no warranty from original manufacturer.

Ultra-Violet Light system and all liquids handling pumps are warranted by their respective manufacturers which is generally one (1) year from date of shipping from the factory.