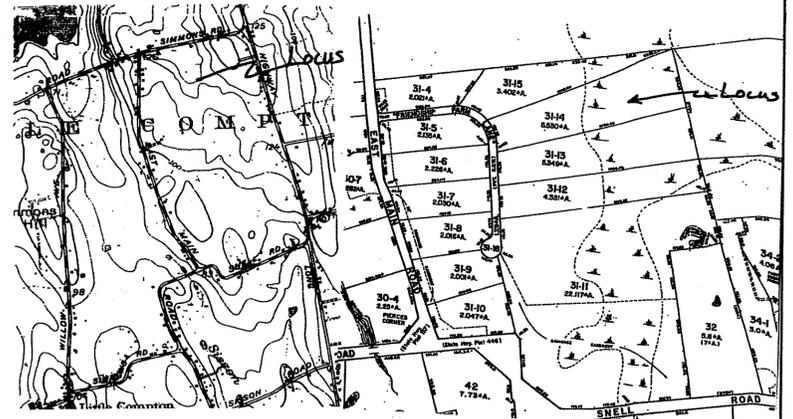
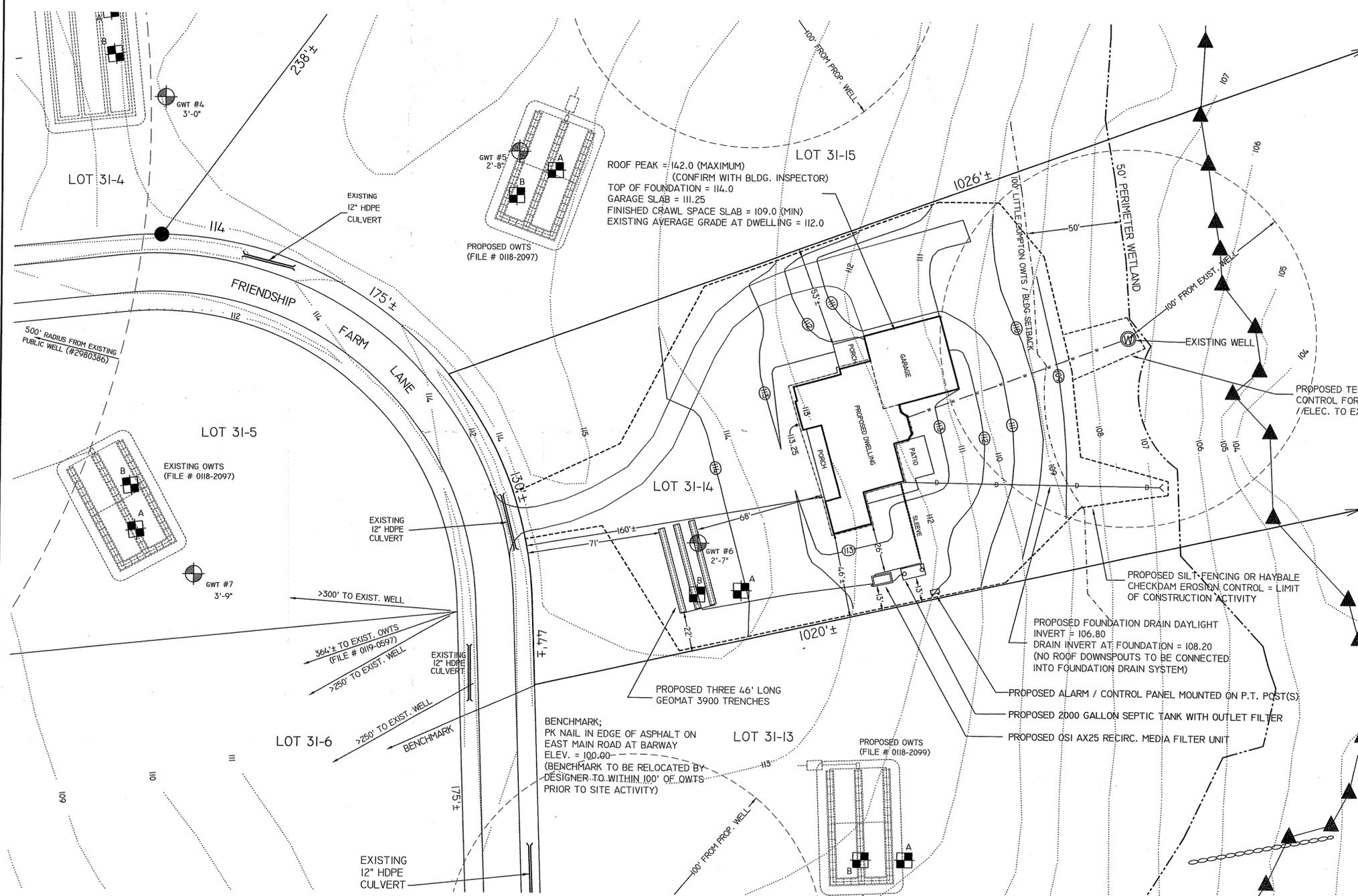
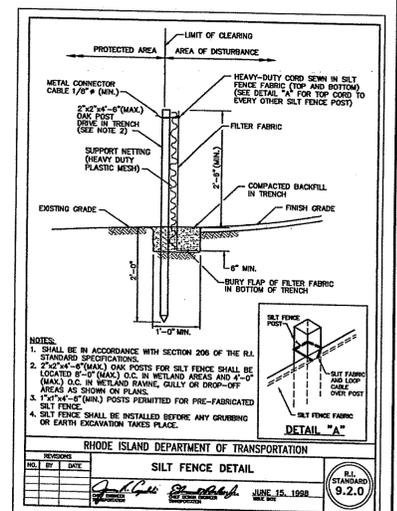
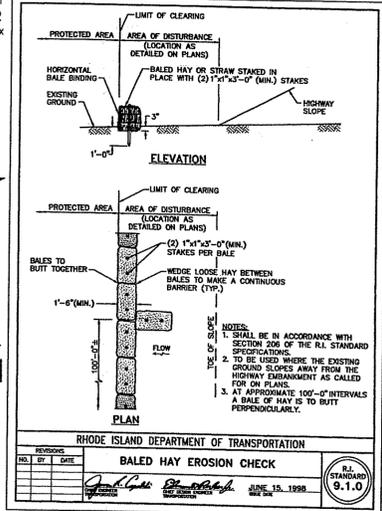


NOTE: A start up test of the system is required to be performed by an Orenco representative and witnessed by the Designer. It is the Contractor's responsibility to notify the Designer at least 48 hours before the scheduled test. Failure to do so will result in delays and additional costs to Installer.



Environmental Management  
DEC 18 2015  
Office of Water Resources



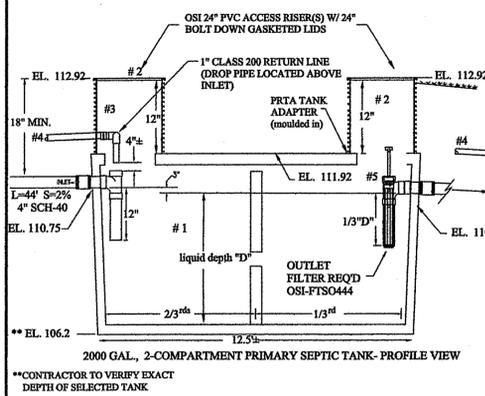
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
REVIEWED SITE PLAN APPLICATION NO. 15-0263  
DATED JAN 15 2016  
SEE LETTER OF SAME DATE.

SITE PLAN  
1" = 30'

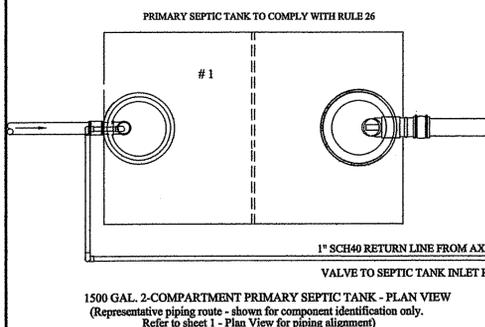
WILLIAM F. SMITH  
No. 55084  
REGISTERED PROFESSIONAL ENGINEER

#1: 12/15/15: REVISE WELL LOCATION  
REVISIONS:

OWTS NEW CONSTRUCTION PLAN  
PREPARED FOR  
**GLEN BROWN**  
ASSESSOR'S PLAT 29 LOT 31-14  
FRIENDSHIP FARM LANE  
LITTLE COMPTON, RHODE ISLAND  
SCALE: 1" = 30' DATE: DECEMBER 15, 2014  
**Civil Engineering Concepts, Inc.**  
34A MAIN STREET P.O. BOX 5323  
LITTLE COMPTON, RI 02837 NEW BEDFORD, MA 02742  
PH: (401) 592-0177 NEW BEDFORD, MA (508) 990-4900  
FAX: (401) 592-0178 EMAIL: wsmithccc@aol.com  
SHEET 1 of 2 JOB #14-063



- 2000 gallon H-10 rated Processing Tank with baffle wall.
- 24" dia. OSI PVC inlet and outlet risers, w/ fiberglass bolt down covers, on watertight tank adapter.
- Riser inlet for 1" return line with OSI-provided grommet.
- 1" return line to discharge directly above an inlet tee.
- OSI or equivalent effluent outlet filter.
- Manifold and spin nozzles.
- Textile treatment media.
- Tank baffle wall.



**SEPTIC (PRIMARY TREATMENT) TANK DETAILS**  
NOT TO SCALE

NUMBER OF BEDROOMS: 5 - proposed  
 DESIGN GALLONAGE: 575 GPD  
 GARBAGE GRINDER: Not Allowed  
 LEACHING SYSTEM USED: Bottomless Sand Filter  
 SIZE OF PRIMARY SEPTIC TANK: 2000 gallons  
 SECONDARY TREATMENT UNIT: Advantex AX25-RT Treatment Unit  
 SOIL CATEGORY: Soil Category 9  
 BSF LOADING RATE: 1.5 gal/s/day, timed dose category 1 L.R.

TOTAL SQUARE FOOTAGE REQ'D:  
 575 GAL/DAY  
 1.5 L.R. = 383.4 S. F. REQUIRED

GEOMAT 3900 (39" wide units) LINEAR FOOTAGE REQUIRED:  
 384 S.F. required  
 3.25 equiv. SF per LF = 118.2 L.F. REQUIRED.

GEOMAT 3900 LINEAR FEET PROVIDED:  
 3 TRENCHES @ 46.0' (each) = 138.0 L. F. PROVIDED (ORIFICES 24" O.C.)  
 (138 total Orifices) (448.5 S.F. EQUIV.)

GEOMAT 3900 MAXIMUM DOSING VOLUME PER CYCLE:  
 0.75 max. gal. x 138 lf = 103.5 gal.  
 linear foot per cycle

PROPOSED DOSING:  
 44.1 gal/cycle + 11.2 gallons drainback = 55.3 gallons max. discharge per cycle

44.1 gal/cycle  
 138 linear feet = 0.32 gal/lf. (0.75 gal/lf. max. permitted)

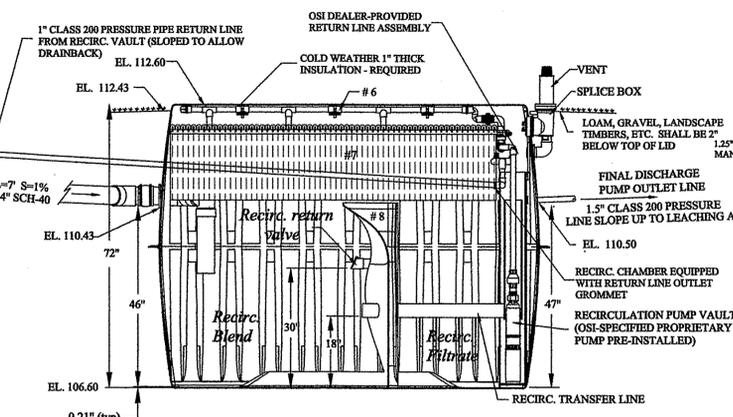
55.3 GALLONS/CYCLE TO BE PROVIDED (by timer settings)  
 60 seconds run time based on pump curve (to be field checked by OSI representative)  
 55.3 gal/cycle - 11.2 gallon drainback = 44.1 gallons discharge to Geomat  
 (134 cycles per day)

**BASIS OF SANITARY DESIGN**

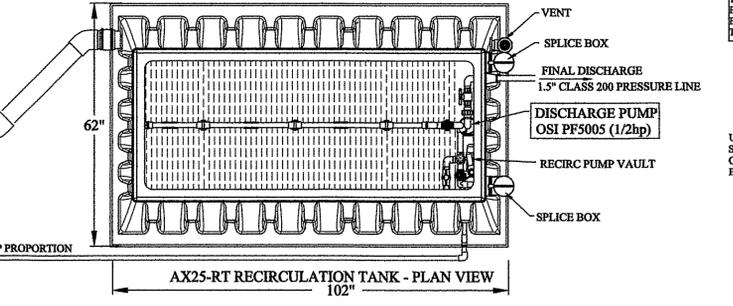
- 111.72.....Invert at foundation
- 110.75.....Inlet invert at Septic Tank
- 110.50.....Outlet invert at Septic Tank
- 109.92.....Elevation of Water Table at Septic Tank (31")
- 112.5 .....Average exist. grade at Septic Tank
- 110.43.....Inlet invert at AX25-RT Chamber
- 110.50.....Invert out of AX25-RT Chamber
- 114.70.....Min. grade above Geomat
- 114.13 .....Invert of Lateral (aid level)
- 114.04.....Top of Geomat
- 113.96.....Bottom of Geomat\*
- 111.92.....Elev. of Water-Table at Geomat (31")
- 114.5 .....Existing Average Grade at Geomat

\*Note: All "A" horizon material and any fill encountered shall be removed from bottom of Geomat trenches. Any built up of material between the prepared native soil base and bottom of the Geomat shall utilize C33 sand only.

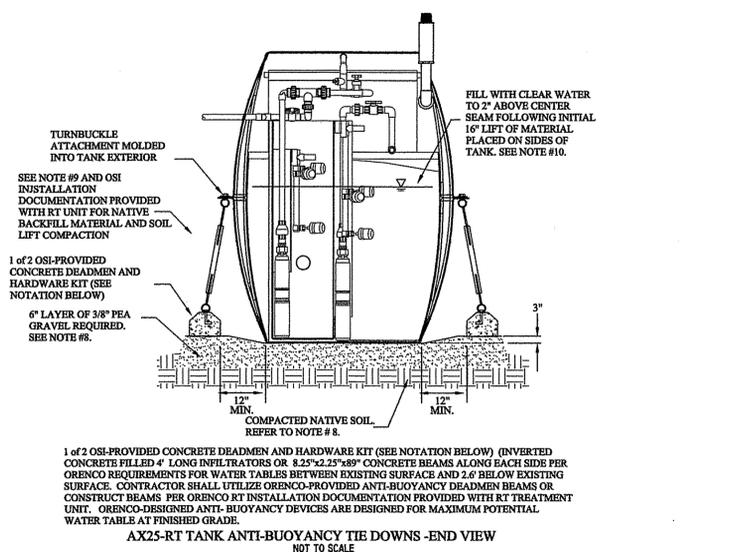
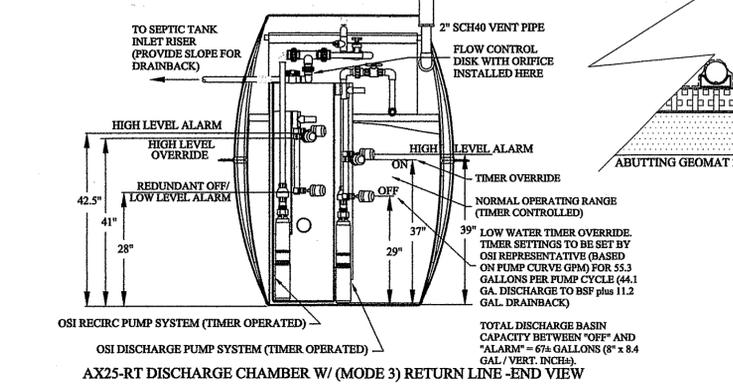
**ELEVATION SCHEDULE**



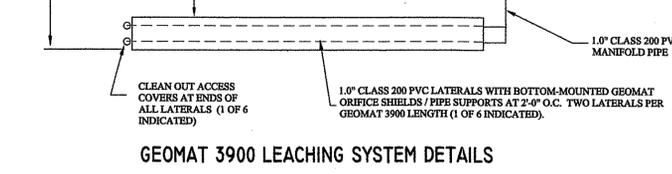
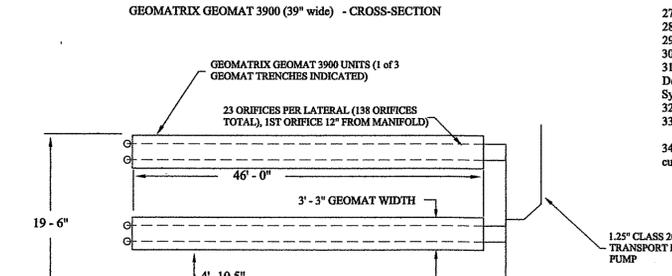
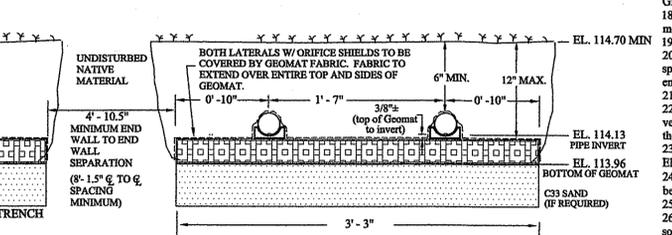
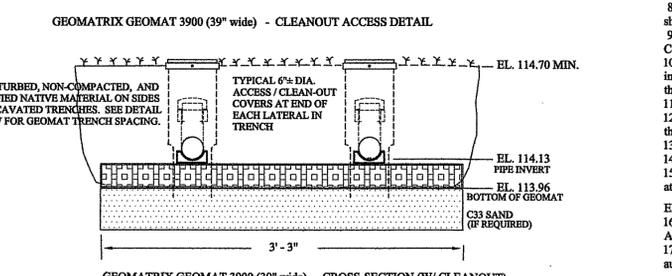
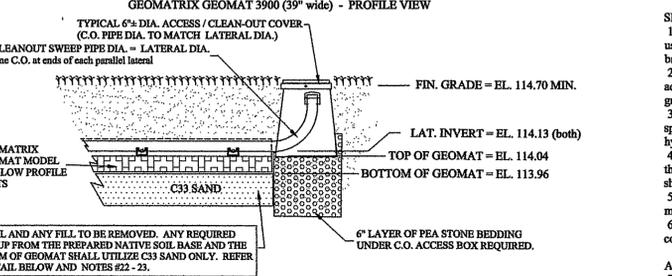
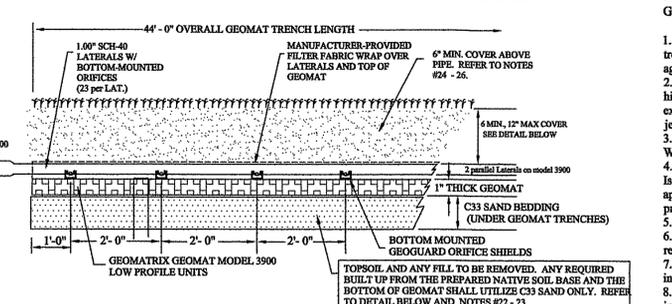
**AX25-RT RECIRCULATION TANK - PROFILE**  
WITH (MODE 3) RETURN LINE TO PRIMARY TANK FOR ENHANCED NITROGEN REDUCTION  
NOT TO SCALE



**AX25-RT DISCHARGE CHAMBER W/ (MODE 3) RETURN LINE - END VIEW**  
NOT TO SCALE



1 of 2 OSI-PROVIDED CONCRETE DEADMEN AND HARDWARE KIT (SEE NOTATION BELOW) (INVERTED CONCRETE FILLED 4\"/>



**PROCESSING TANK**  
 Tank type: 2000 Gallon Tank Wt.: 15,800 lbs.  
 Weight of Earth Cover (12\"/>

**OSI RT TANK:**  
 Water table depths of less than 2.6' require anti-buoyancy deadmen per Orenco anti-buoyancy calculations. ANTI-BUOYANCY DEADMEN SHALL BE INSTALLED AS SHOWN ON DETAIL AND SHALL BE IN COMPLIANCE WITH THE APPROVED ORENCO INSTALLATION MANUAL (PROVIDED BY OSI TO CONTRACTOR WHEN COMPONENTS SHIP TO SITE). Refer to documentation attached to the OWTS application.

**BUOYANCY CALCULATIONS**

**GENERAL CONSTRUCTION NOTES:**

- The proposed OWTS design utilizes one or more pumping systems and advanced treatment components. This OWTS requires on-going maintenance (in accordance with the treatment system manufacturer and RI DEM) as part of the system approval. The property owner is responsible for maintaining a current Operation and Maintenance (O&M) agreement with the components manufacturer's representative.
- System installation shall be during dry months (June-October) typically unless specific arrangements are made with Designer. This is necessary to avoid complications with a high water table or excessive surface water runoff during construction. A high water table or saturated ground conditions during installation could compromise the quality and life expectancy of the system. Designer reserves the right to restrict the timing of installation if high groundwater conditions or forecasted inclement weather are present and could jeopardize the quality of the system installation.
- All construction shall conform to RI DEM - Rules and Regulations Establishing Minimum Standards relating to Location, Design, Construction, and Maintenance of On-Site Wastewater Treatment Systems, and in accordance with the GEOMAT manufacturer's installation requirements.
- All work shall be done in a workmanlike manner, with lines laid as straight as possible and joints made watertight, and performed by an Installer licensed in the State of Rhode Island and approved for GEOMAT installation by the manufacturer / distributor. Dig-Safe notification is required prior to any excavation. Any underground utilities shown are prior to "start of construction" request by the Installer.
- Contractor or homeowner shall provide the Designer with a copy of the recorded O&M prior to the Designer's issuance of Certificate of Construction.
- Areas to be utilized for the GEOMAT shall remain clear of all vehicles, equipment, and stockpiles materials. Contractor shall delineate the GEOMAT area with caution tape to restrict access. Compaction or smearing of native soil will compromise the operation of the GEOMAT.
- Proper size hole saws, in good conditions, are to be used for the installation of conduit/piping grommets. Refer to, and follow, required hole sizes specified in manufacturer's installation documentation. Any conduit/piping installed into risers or tanks that is not watertight will not be approved by the Designer.
- Designer is to be notified 72 hours prior to the start of OWTS construction. Contractor is to ensure that Designer is notified 2 working days in advance of any required inspections so proper notification to RI DEM can be made. Work shall not continue until the previous stage is inspected and approved.

**SEPTIC (PRIMARY TREATMENT) TANK:** Gallonage as specified on Processing Tank Detail

- Concrete or RI DEM approved poly/fiberglass septic tank may be installed. Poly/fiberglass tank will require the use of feathered deadmen to counter buoyancy. Contractor shall use tank-manufacturer-specified and provided concrete deadmen. Contractor is responsible for scheduling the required Designer inspection of the deadmen before completing tank backfill.
- Tank shall be equipped with suitable cast-in-place PVC mounting flange for detail-specified diameter inlet & outlet PVC risers. Watertight bonding epoxy (or other proper adhesive) required between tank adapters and risers. Access covers are not to be covered with soil. Final loam placement (elevation) shall be at least 1" below the access covers and grade away from the tank to prevent surface water from ponding on or entering the covers.
- All tank seams, riser connections (if any) and all plumbing joints are to be installed 100% watertight, sealed with suitable gasket material, or other bonding agent suitable for that specific component. Any knock-out holes in the bottom of the tank shall remain sealed with suitable plug and hydraulic cement. Unused inlet/outlet knock-outs shall be sealed with hydraulic cement. Static water test required on the tank following attachment of risers. The life span of the system would be compromised by the intrusion of any groundwater.
- Manufacturer's mounting hardware for any specified return lines from secondary treatment unit to primary septic tank shall be utilized. All materials and construction shall meet the manufacturer requirements and applicable building, plumbing, electrical, and safety codes. Third party or alternate generic parts requiring substantial field modifications to fit shall not be permitted.
- A sign shall be posted in the vicinity of pump manholes warning of the potential of hazardous sewer gases and the need for proper confined space entry, venting, and air monitoring prior to working on the pump assembly.
- Electrical wiring is to be encased in suitable conduit with proper fittings at each end to maintain a waterproof connection and prevent transport of vapors or fumes. Electrical components to the control panel and building. Electrical installation shall conform to all applicable local/state regulations.

**ADVANTECH AX25-RT SECONDARY TREATMENT UNIT WITH RECIRCULATING MEDIA FILTER:**

- AX25-RT unit ("RT") shall be installed in accordance with the applicable RI DEM regulations and the Orenco Installation Manual for the RT ("OSI manual").
- The RT unit shall be laid level on a 4" (min) thick bed of coarse sand or 3/8" (max. size) pea gravel, compacted in place. Any stones larger than 3" dia. (and any foreign material) shall be removed and the bottom of the excavation re-leveled prior to placing bedding material.
- Deadmen are required to be installed to prevent tank floatation. OSI-provided deadmen and attachment hardware shall be used. Any alternate deadmen constructed by the Contractor shall conform to the "Concrete deadmen" design criteria specified in the OSI manual.
- RT unit backfilling, including tank water filling and lid attachment, shall conform to the partial backfilling and water tightness test as detailed in the OSI manual, including: (1) initial 16" lift of compacted backfill, (2) fill with clear water to 2" above center seam and, (3) remaining 16" lifts of compacted backfill. Backfill shall be free of all stones greater than 2", peat, other organic materials, clay, and foreign debris.
- All gravity piping connected to the RT unit shall be SCH-40. All pressure piping shall be Class 200 (SCH40 or SDR21) with pressure rated fittings (no DWV-type fittings).
- The Passive Air Vent shall be located within 15' of the RT. 2" SCH-40 PVC connector pipe shall slope down from vent to the RT to allow draining of condensation. Bottom of the perforated air intake shall be 12" minimum above finished grade.
- Hand compaction of backfilled material around the RT and related piping is required to prevent settlement and air pockets that may fill with water resulting in floatation.
- The top of the RT cover shall be 2" above finished grade to prevent surface water and debris from entering the RT when opened.
- A start up test of the RT unit is required to be performed by an Orenco representative and witnessed by the Designer. It is the Contractor's responsibility to notify the Designer at least 48 hours before the scheduled test.

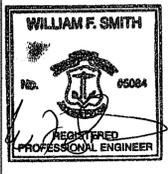
**ELECTRICAL CONTROL/ALARM PANEL:** w/ telephone line remote telemetry connection

- Control Panel shall be an OSI Vericom pump-matched NEMA-4 rated waterproof lockable unit for the RT with visual alarms and programmable timer that operates both OSI AX Media Filter pump unit and B.S.F. pump on same circuit.
- Panel to be mounted on P.T. post(s) within view of the tanks. Outside face of Control Panel shall be equipped with high-intensity alarm light and alarm silence button that shall automatically reactivate after 12 hours.

**GEOMATRIX GEOMAT (Model 3900 - 39" wide) LEACHING SYSTEM:**

- Geomat installation shall conform to the RI DEM Certification for the component and the Geomatrix Rhode Island Design Manual for Geomat 1200 & 3900 Leaching Systems, as most recently amended.
- Manifold: Class 200 PVC (SCH-40 or SDR-21), size as specified on plan details, with pressure rated fittings (DWV-type fittings not permitted).
- Distribution lateral: Geomatrix-provided Class 200 PVC lateral piping (two laterals per mat required - sized as specified on plan), with 1/8th inch orifice holes predrilled at intervals specified. Pressure rated fittings required (DWV-type fitting NOT permitted). O.S.I. cleanout / flushing assembly (including sweep el. (or 45s) and threaded female cap) required at end of each lateral. Diameter of C.O. pipe to match diameter of specified laterals. Polyethylene access box cover to be at grade.
- All orifices on bottom of laterals shall be fitted with Geoguard orifice shields. Alternate orifice shields may only be used with Vendor's approval.
- Leaching area excavation shall be level and scarified. Care shall be taken to avoid compaction or smearing of the remaining native soil. Excavated area shall be stripped of vegetation, any fill, "A" Horizon (topsoil), and any unsuitable soil / foreign material. Immediate underlying subsoil (B-Horizon) shall remain intact, uncompacted, and scarified provided the subsoil layer is suitable. In the event the subsoil layer contains unsuitable soil or fill, excavation shall extend down to suitable soil.
- Any additional build up of material necessary between the top of the prepared native soil and the bottom of the Geomat shall consist of C-33 sand only (see notation under the Elevation Schedule).
- Earth cover over the Geomat system shall consist of a minimum of 6" (above the lateral) of clean soil free from deleterious material and stones greater than 1". Cover material shall be no greater than 12" anywhere above the Geomat system. The top 4" (min) of backfill shall be screened loam.
- Trees and shrubs shall not be planted within 10' of the Geomat.
- Heavy equipment shall not be operated over the components or the prepared leaching area during installation. Rubber tire machinery is NOT to be driven over the prepared natural soil base, any C33 bedding, or the Geomat system.
- ALL EXISTING OR PROPOSED (if any) WELLS within 200' of proposed OWTS are shown. Property is serviced by private on-site well.
- ALL EXISTING OR PROPOSED (if any) PUBLIC WELLS within 500' of proposed OWTS are shown.
- ALL EXISTING OR PROPOSED SEPTIC SYSTEMS within 100' of any proposed or existing on-site well are shown. Site is serviced by private on-site well.
- NO PARKING is permitted in the vicinity of the OWTS.
- No upgradient drains allowed within 25' of proposed OWTS. No downgradient drains allowed within 50' of leaching area or within 25' of other OWTS components. Refer to RI Department of Environmental Management - Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of On-Site Wastewater Treatment Systems, Table 22.1.1 Minimum Setback Distances.
- A backup generator (adequate for supplying the pumps in case of electrical failure) is strongly recommended.
- Property lines as depicted on this plan are the result of a boundary survey.
- A manufacturer-approved maintenance contract for the pump/filter system is required to be filed in the applicable Town Hall Land Evidence records office. Contract must be kept current as a condition of approval.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 FRESHWATER WETLANDS PROGRAM  
 REVIEWED SITE PLAN APPLICATION NO: 15-0243  
 DATED JAN 15 2016  
 SEE LETTER OF SAME DATE.



**OWTS NEW CONSTRUCTION PLAN**  
 PREPARED FOR  
**GLEN BROWN**  
 ASSESSOR'S PLAT 29 LOT 31-14  
 FRIENDSHIP FARM LANE  
 LITTLE COMPTON, RHODE ISLAND

SCALE: NONE DATE: DECEMBER 15, 2014

**Civil Engineering Concepts, Inc.**  
 34A MAIN STREET P.O. BOX 5325  
 LITTLE COMPTON, RI 02857 NEW BEDFORD, MA 02742  
 PH: (401) 592-0177 (508) 990-4900  
 FAX: (401) 592-0178 EMAIL: wsmithceco@aol.com

REVISIONS:  
 #1, 12/15/15: NO REVISION THIS SHEET  
 SHEET 2 OF 2