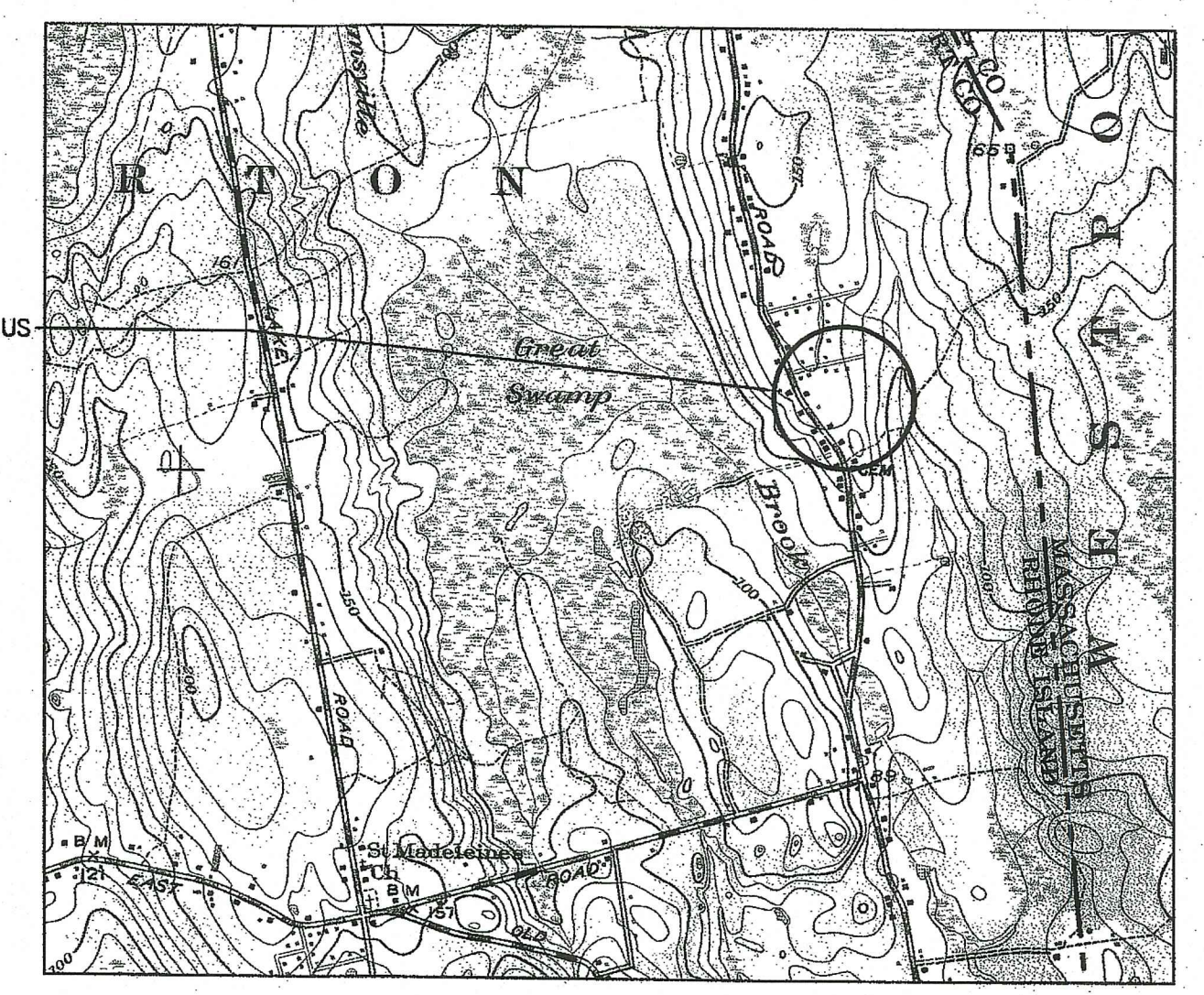
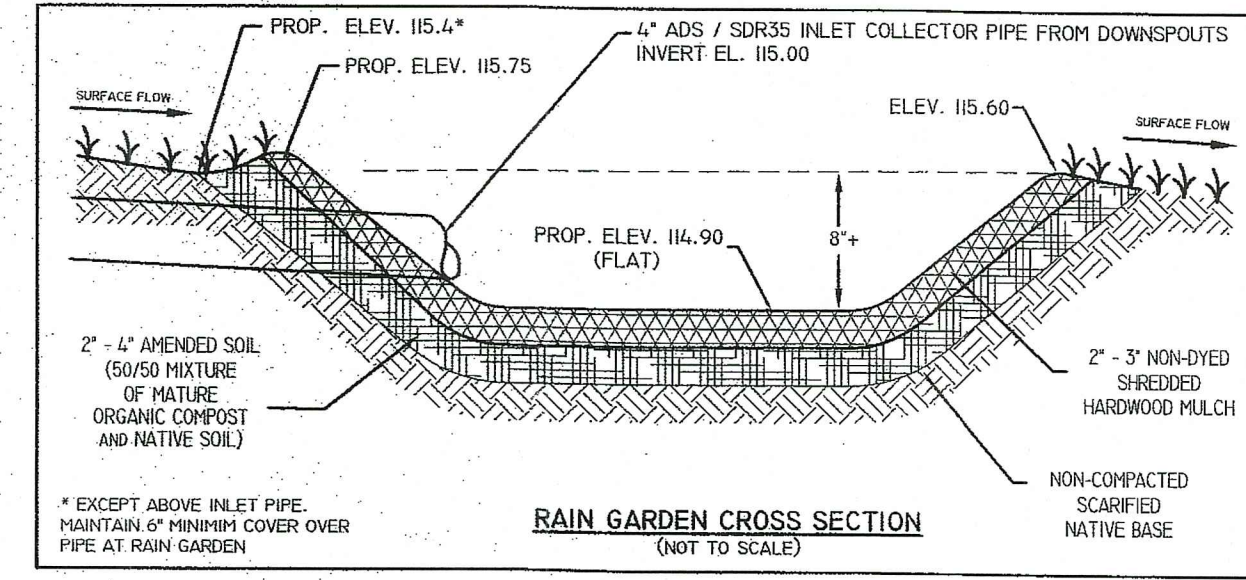


RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 APPROVED WITH CONDITIONS AS
 SPECIFIED IN THE LETTER OF APPROVAL
 DATED: JUL 14 2023 FILE # 22-0192
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE

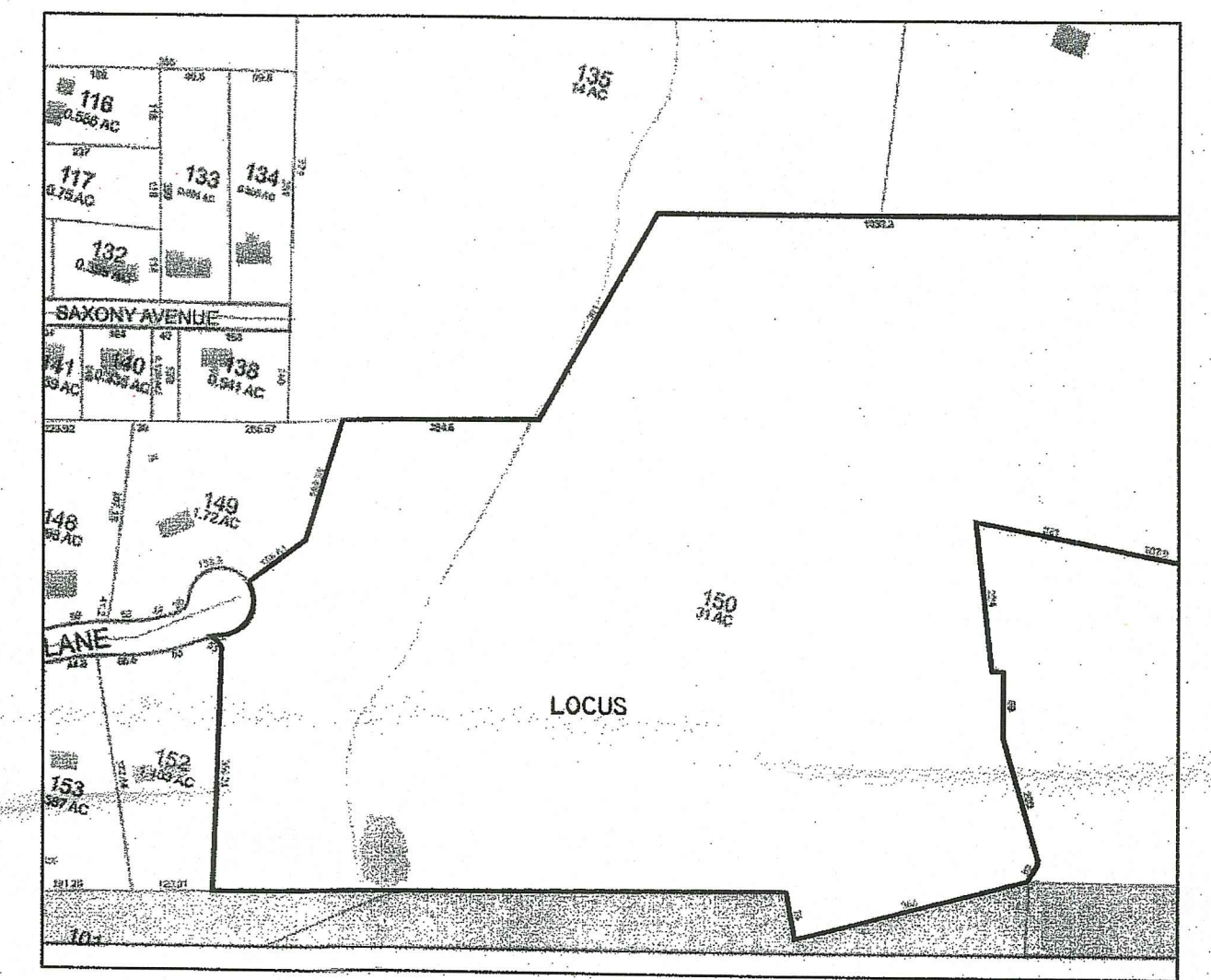
PROPOSED IMPERVIOUS COVERAGE:
 960 SF PROPOSED DWELLING FOOTPRINT
 (DRIVEWAY TO BE PERVIOUS GRAVEL)
 960 SF TOTAL IMPERVIOUS COVERAGE PROPOSED

PER RI STORMWATER MANAGEMENT GUIDELINES FOR INDIVIDUAL SINGLE FAMILY RESIDENTIAL LOT DEVELOPMENT, TABLES 7 AND 8, RAIN GARDEN SIZING:
 800 SF OF DRAINAGE AREA IN SILTY SOILS REQUIRES 128 SF OF RAIN GARDEN AT 8\"/>

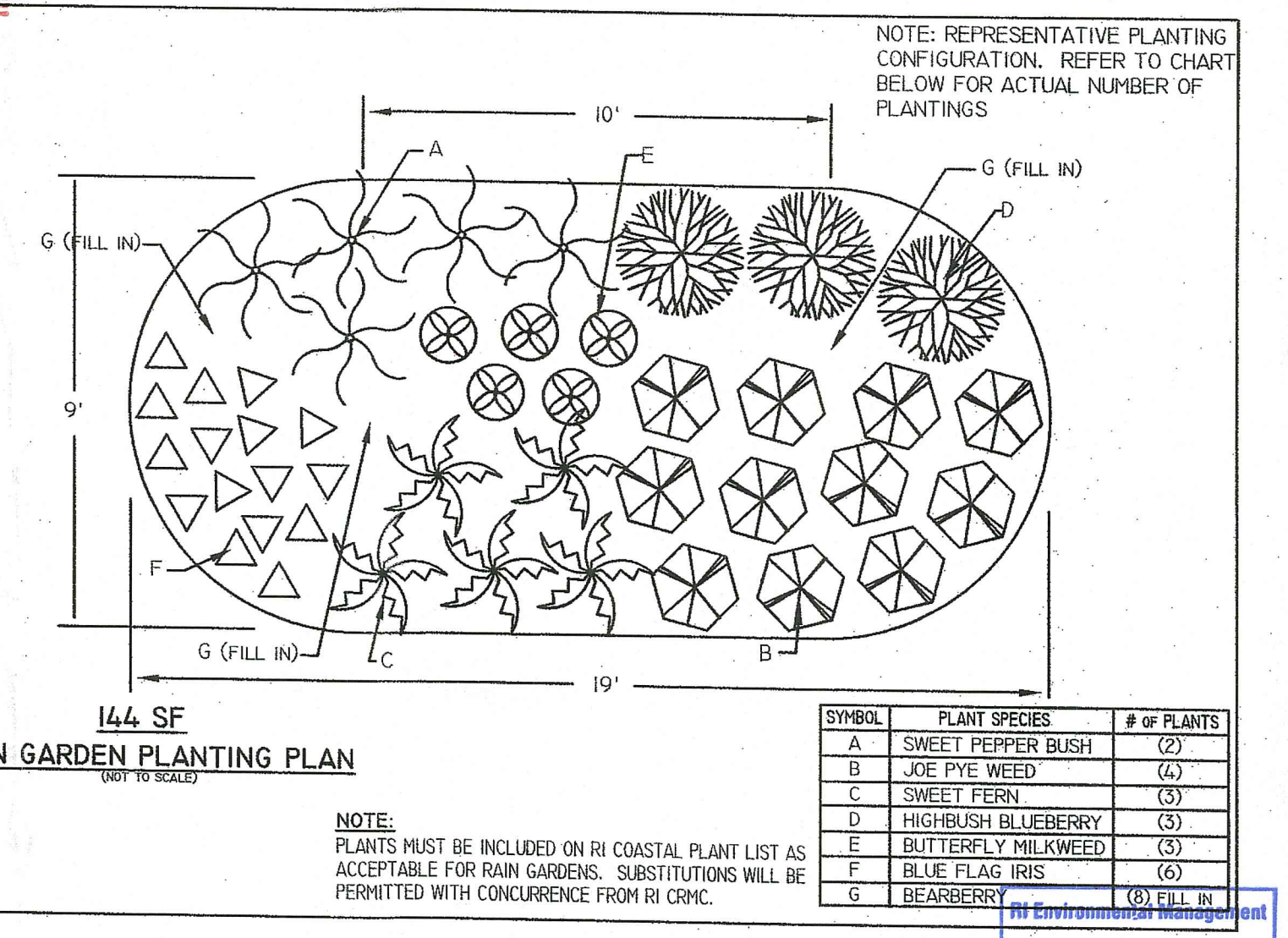
PROPOSED: 170 SF OF RAIN GARDEN, 8\"/>



LOCUS MAP
 SCALE: 1" = 2000'±



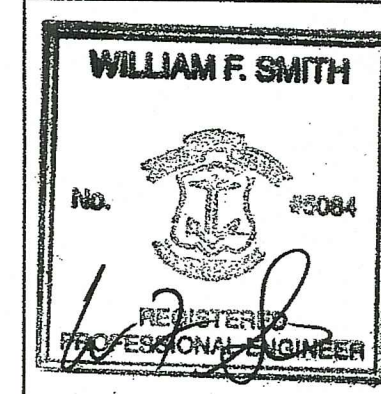
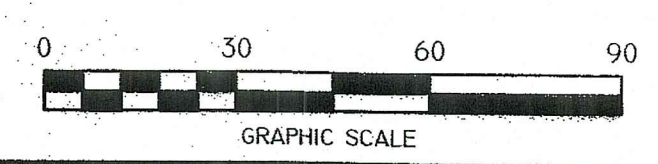
ASSESSOR'S MAP
 NOT TO SCALE



SYMBOL	PLANT SPECIES	# of PLANTS
A	SWEET PEPPER BUSH	(2)
B	JOE PYE WEED	(4)
C	SWEET FERN	(3)
D	HIGHBUSH BLUEBERRY	(3)
E	BUTTERFLY MILKWEED	(3)
F	BLUE FLAG IRIS	(6)
G	BEARBERRY	(8) (FILL IN)

- LEGEND**
- 100' EXISTING CONTOUR
 - 10' PROPOSED CONTOUR
 - STONE WALL
 - APPROXIMATE PROPERTY LINE
 - DELINEATED WETLAND LINE
 - 50' PERIMETER WETLAND
 - APPROXIMATE EDGE OF RIVER
 - 200' RIVERBANK WETLAND
 - GROUNDWATER TABLE TEST PIT
 - EXISTING WELL
 - WETLAND BUFFER PLANTINGS
 - EXISTING UTILITY POLE
 - PROPOSED UTILITY POLE
 - PROPOSED OVERHEAD WIRE UTILITIES
 - PROPOSED UNDERGROUND WIRE UTILITIES
 - PROPOSED SILT SOCK OR SILT FENCE EROSION CONTROL = LIMITS OF DISTURBANCE

NOTE:
 PER RIDEM WETLAND FLAGS A-1 THROUGH A-5 AND FLAGS A-18 THROUGH A-22 HAVE NOT BEEN VERIFIED BY RIDEM. THESE TWO PORTIONS OF THE DELINEATED SWAMP EDGE ARE CONSIDERED APPROXIMATE ONLY AND ARE NOT VERIFIED AS BEING ACCURATE.



#1: 08/26/22; REVISED PER RIDEM WETLAND BIOLOGIST
 REVIEW COMMENTS DATED 8/16/22
 REVISIONS:

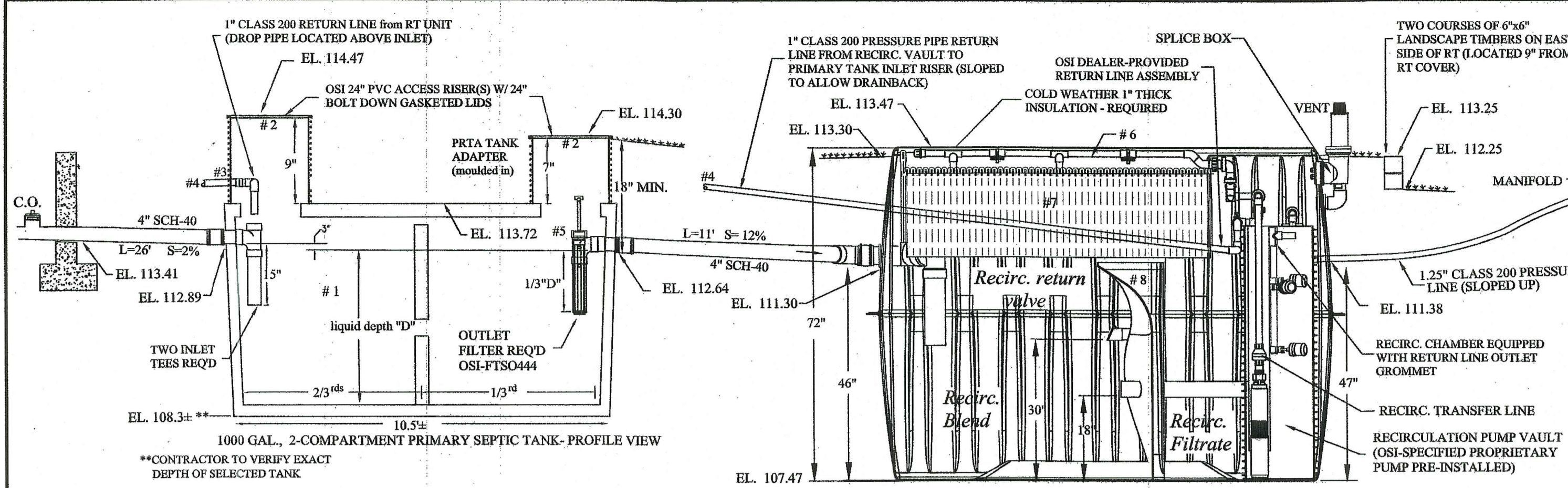
PROPOSED OWTS - NEW CONSTRUCTION
 PREPARED FOR
MARK DEMELLO
 ASSESSOR'S PLAT 61A LOT 150
 BOUCHARD LANE
 TIVERTON, RHODE ISLAND

SCALE: 1" = 30' DATE: SEPTEMBER 14, 2021

Civil Engineering Concepts, Inc.
 34A MAIN STREET P.O. BOX 5323
 LITTLE COMPTON, RI 02837 NEW BEDFORD, MA 02742
 PH: (401) 592-0177 FAX: (401) 592-0178
 EMAIL: wsmith@ceci.com

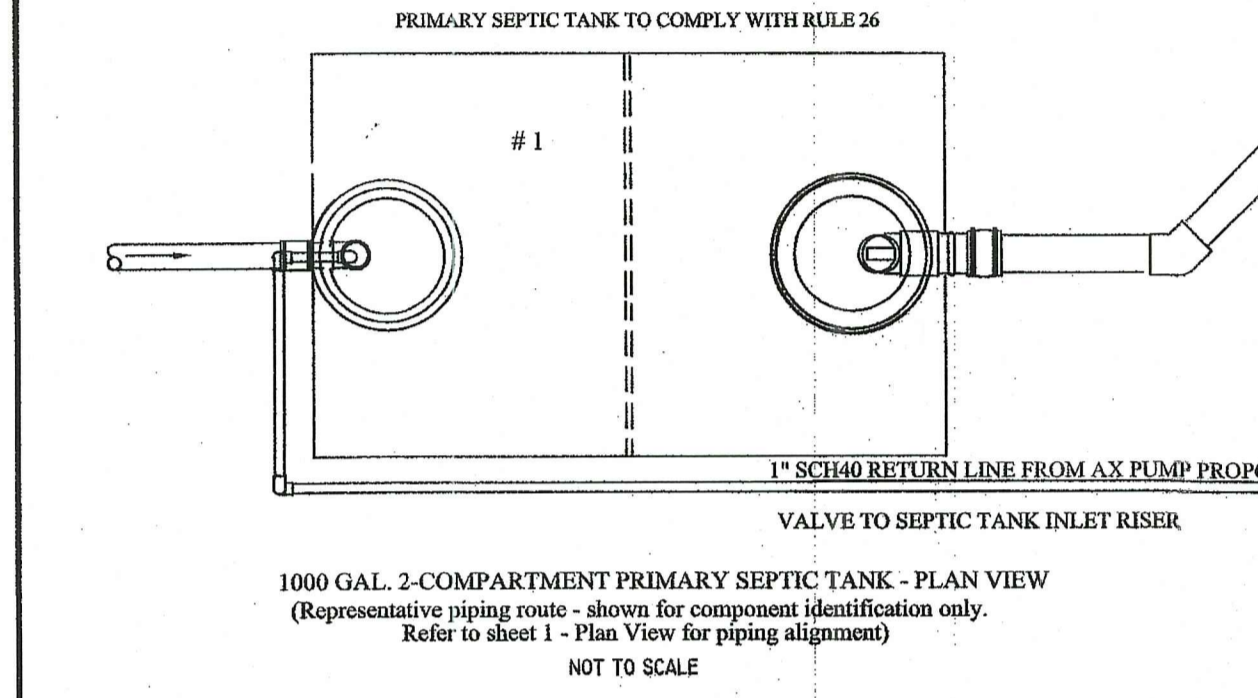
SHEET 1 OF 2 JOB#: 20-031

DEC 16 2022

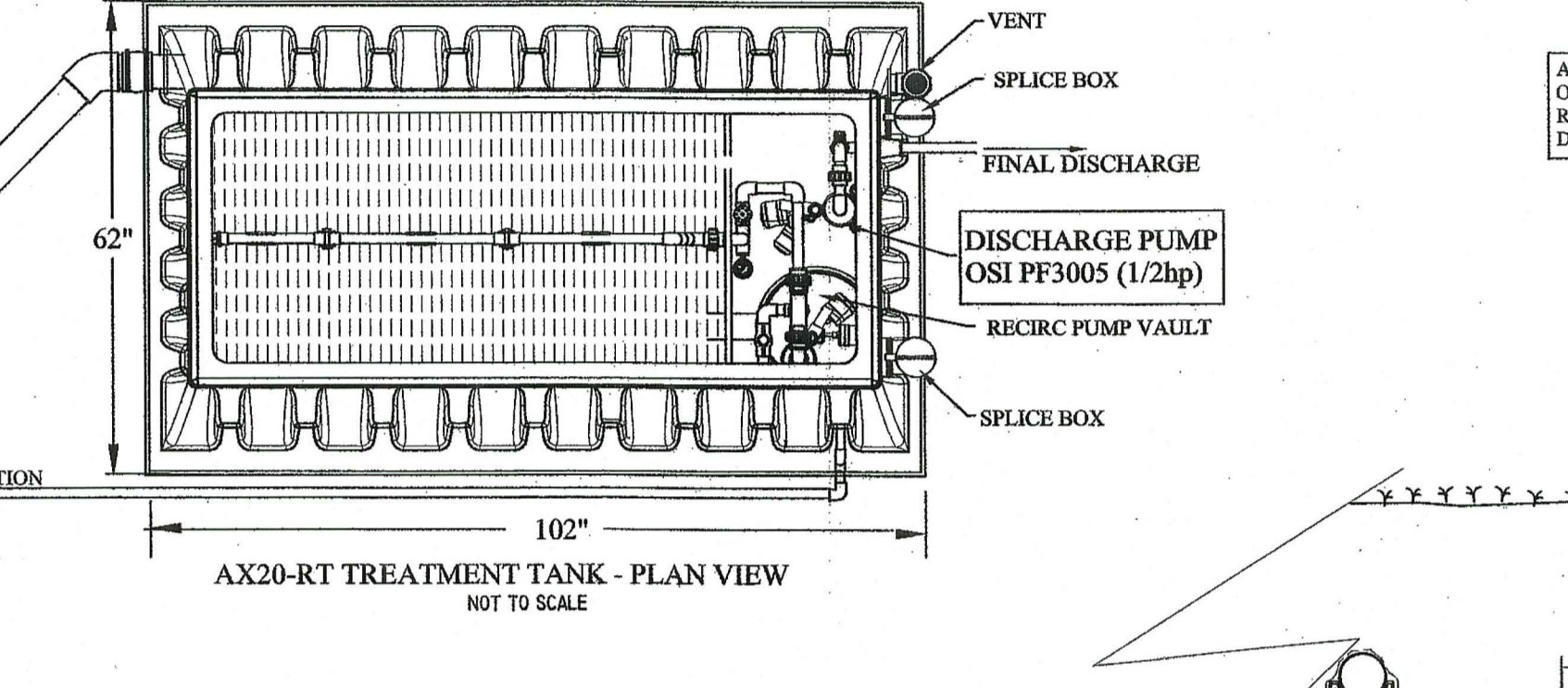


- 1000 gallon H-10 rated Processing Tank with baffle wall.
- 24" dia. OSI PVC inlet & outlet risers, w/ bolt down covers on watertight tank adapter.
- Riser inlet for 1" return line with OSI-provided grommet.
- 1" return line to discharge directly above an inlet tee.
- OSI or equivalent effluent outlet filter.
- Manifold and spin nozzles.
- Textile treatment media.
- Tank baffle wall.

AX20-RT TREATMENT TANK - PROFILE
WITH (MODE 3) RETURN LINE TO PRIMARY TANK FOR ENHANCED NITROGEN REDUCTION
NOT TO SCALE



- 113.41.....Invert at foundation
112.89.....Inlet invert at Septic Tank
112.64.....Outlet invert at Septic Tank
112.5.....Elevation of Water Table at Septic Tank (24")
114.5.....Existing grade at Septic Tank



AX20-RT TREATMENT TANK - PLAN VIEW
NOT TO SCALE

- 111.30.....Inlet invert at AX20-RT Chamber
111.38.....Invert out of AX20-RT Chamber
111.0.....Elevation of Water Table at RT (24")
113.0.....Existing grade at RT
- 116.20.....Proposed minimum grade above Geomat
115.60.....Invert of Lateral (laid level)
115.58.....Top of Geomat**
115.50.....Bottom of Geomat**
113.5.....Elev. of Water-Table at Geomat (24")
107.5.....Elev. of Ledge at Geomat (96")
115.5.....Highest Grade at Geomat

**Note: All "O" and "A" horizon material shall be removed from bottom of Geomat trenches. Any built up of material between the bottom of the excavation (to remove any unsuitable material) and bottom of the Geomat shall utilize C-33 sand only.

ELEVATION SCHEDULE

NUMBER OF BEDROOMS: 3 proposed
DESIGN GALLONAGE: 345 GPD
GARBAGE GRINDER: Not Allowed
LEACHING SYSTEM USED: Bottomless Sand Filter
SIZE OF SEPTIC (PRIMARY) TANK: 1000 gallons
SECONDARY TREATMENT UNIT: Advantex AX20-RT Treatment Unit with recirc. media filter / pump and final discharge pump

SOIL CATEGORY: Cat 8 LOADING RATE: 1.9 gal/sf/day (timed dose category 1)

SQUARE FOOTAGE REQUIRED: 345 GPD / 1.9 = 181.6 SF REQ'D

TOTAL GEOMAT 3900 (39" wide units) LINEAR FOOTAGE REQ'D: 345 GAL/DAY

1.9 L.R. x 3.25 equiv. SF per LF = 55.9 L.F. REQUIRED

GEOMAT 3900 LINEAR FEET PROVIDED: 2 TRENCHES at 30.0' (each) = 60 L.F. PROVIDED (ORIFICES 24" O.C.)

60 L.F. provided x 3.25 = 195.0 EQUIV. SF.

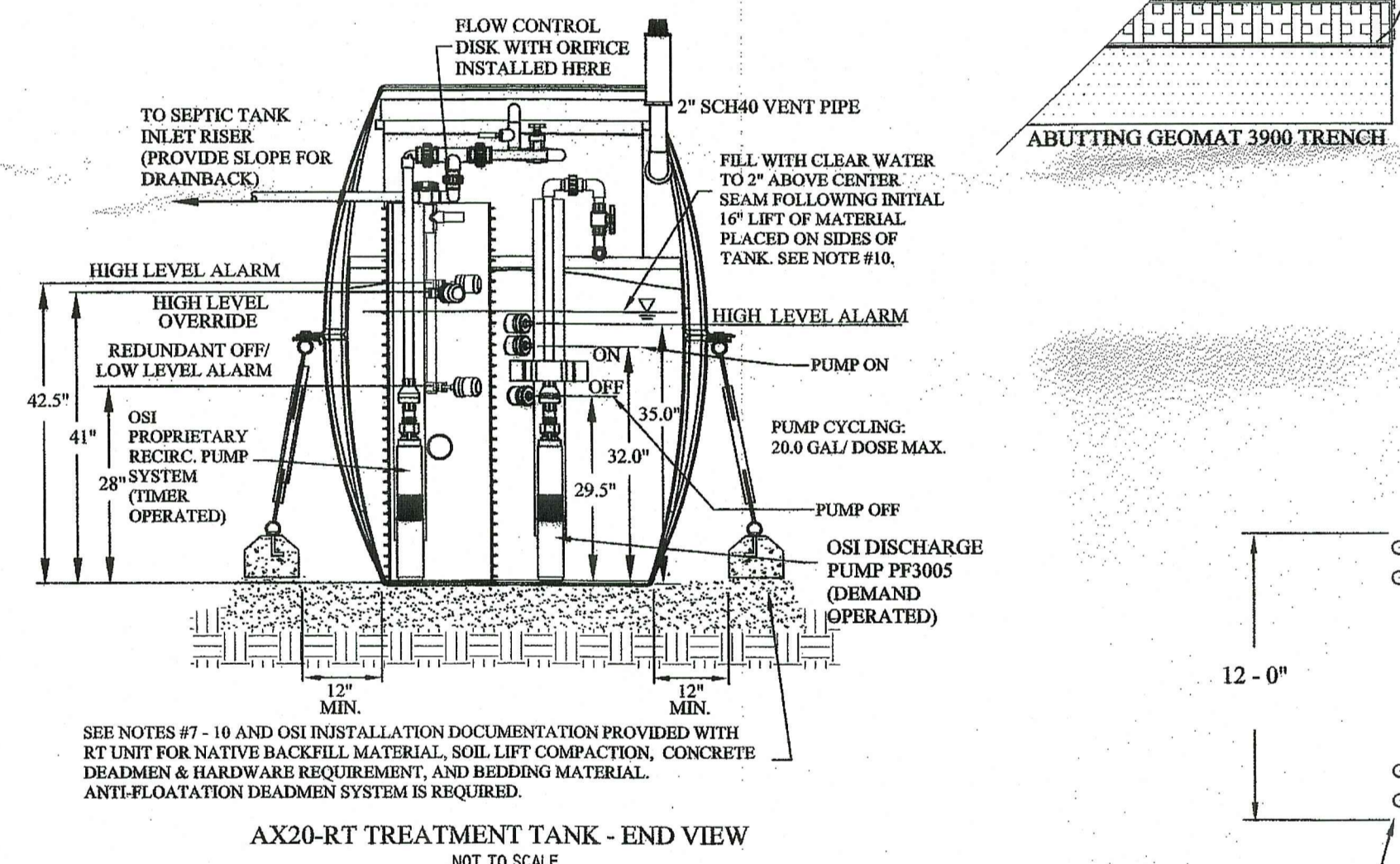
195.0 EQUIV. SF x 1.9 = 370 GAL/DAY CAPACITY

GEOMAT 3900 MAXIMUM DOSING VOLUME PER CYCLE (1 zone): 0.75 max. gal. x 60 lf = 45.0 max. gal. linear foot per cycle

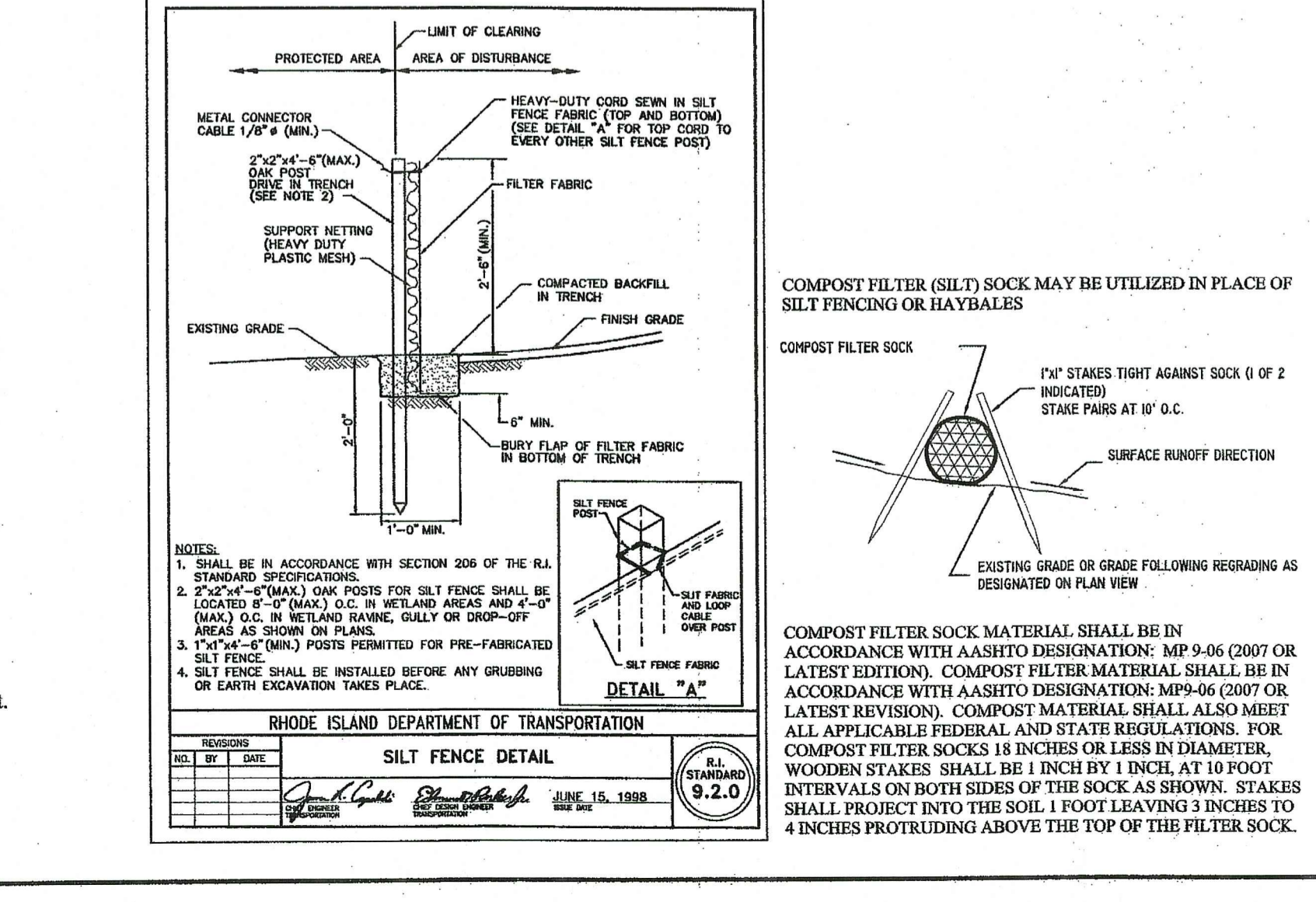
PROPOSED DOSING RATE: 22.0 gal/cycle - 2.3 gal (drainback) 60 lf. = 0.33 GAL/L.F. OF GEOMAT/CYCLE (max. of 0.75 allowed)

DOSING QUANTITY: (Float settings set by OSI Representative / Service provider during Start-Up test. Settings shall provide minimum of one dose per hour. Pump dose shall not exceed 20.0 gallons)

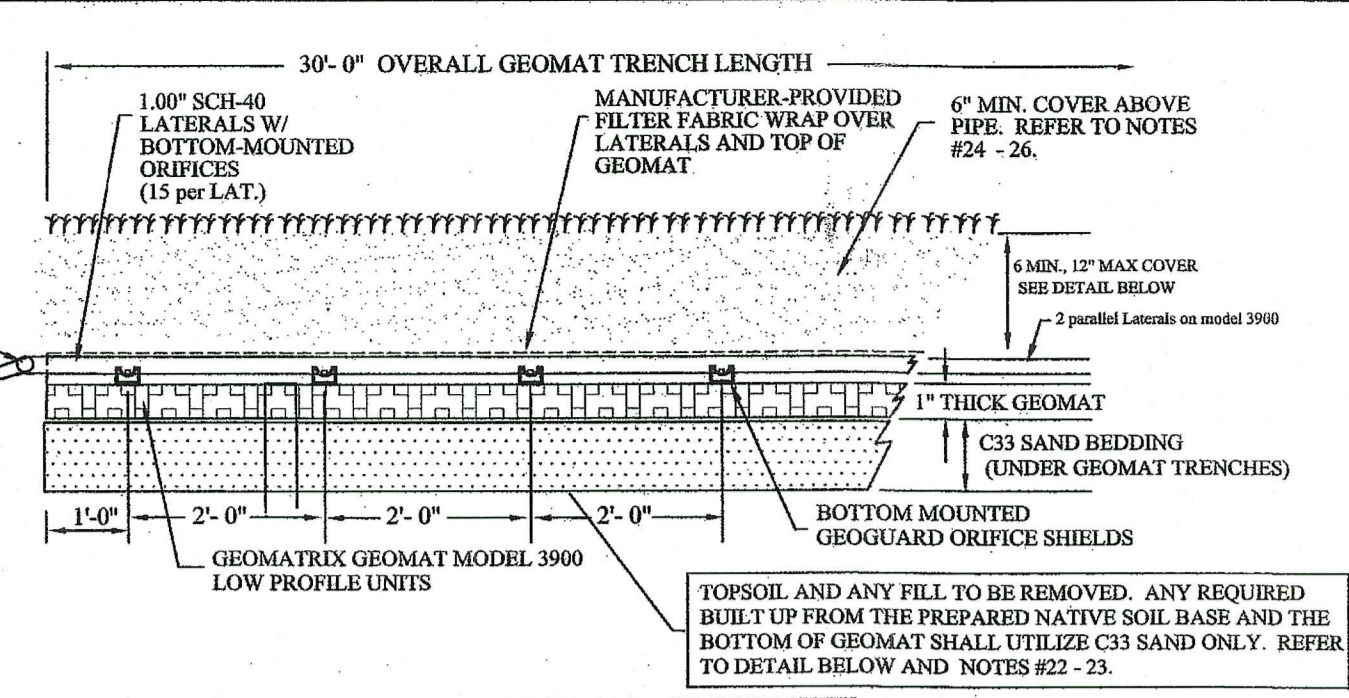
BASIS OF SANITARY DESIGN



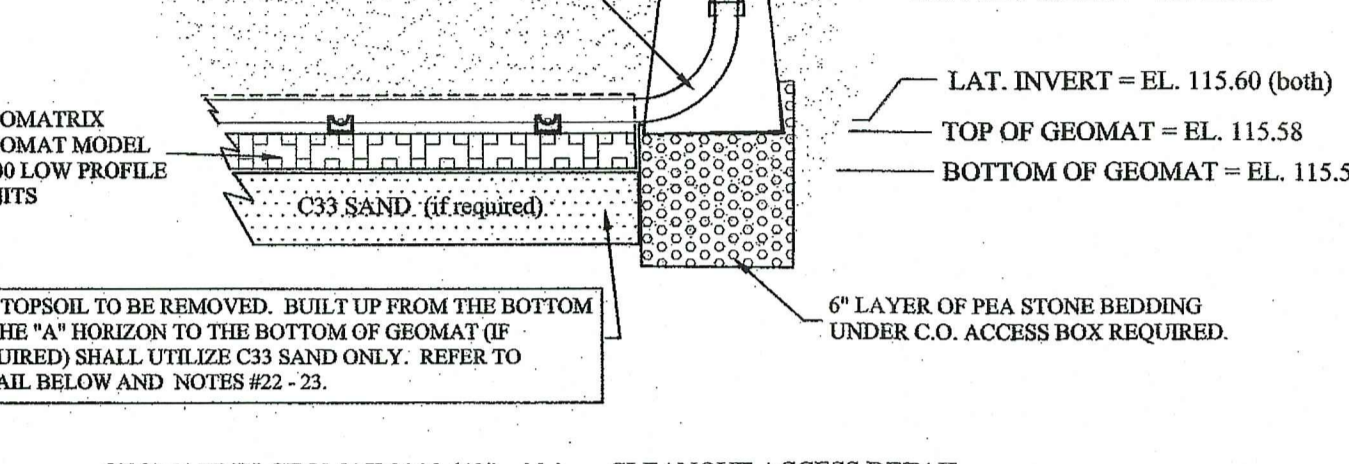
AX20-RT TREATMENT TANK - END VIEW
NOT TO SCALE



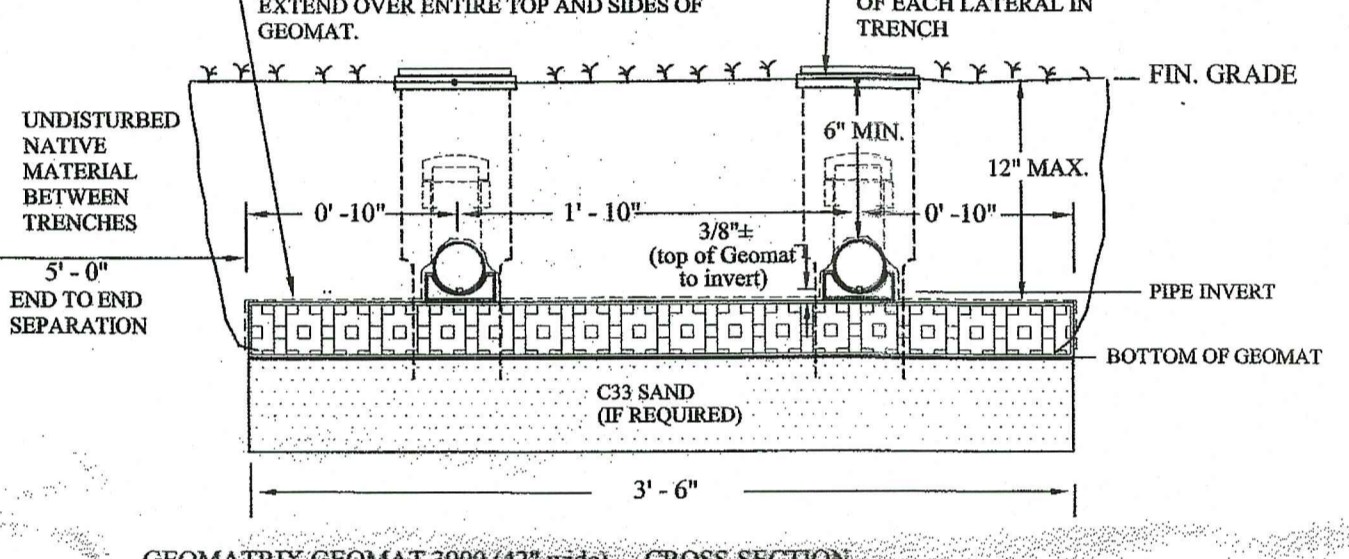
DETAIL "A"



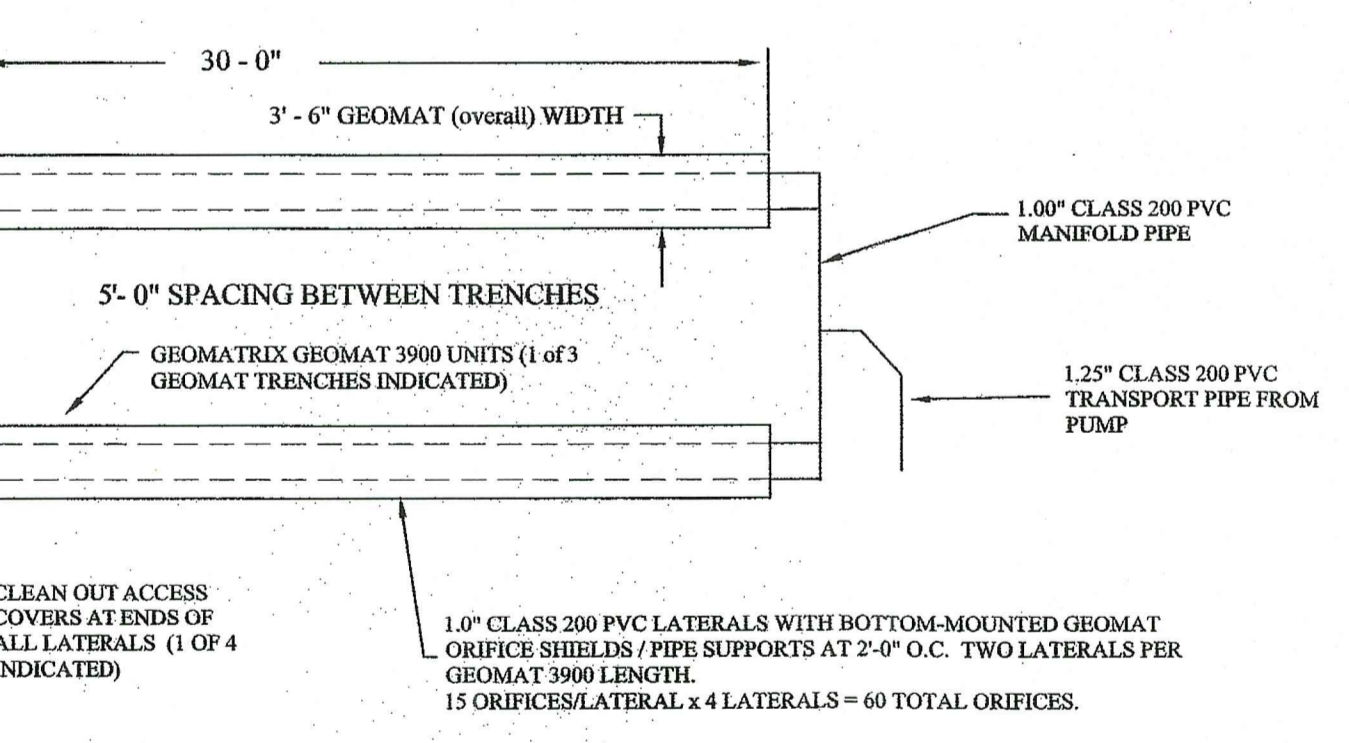
GEOMATRIX GEOMAT 3900 (42" wide) - PROFILE VIEW



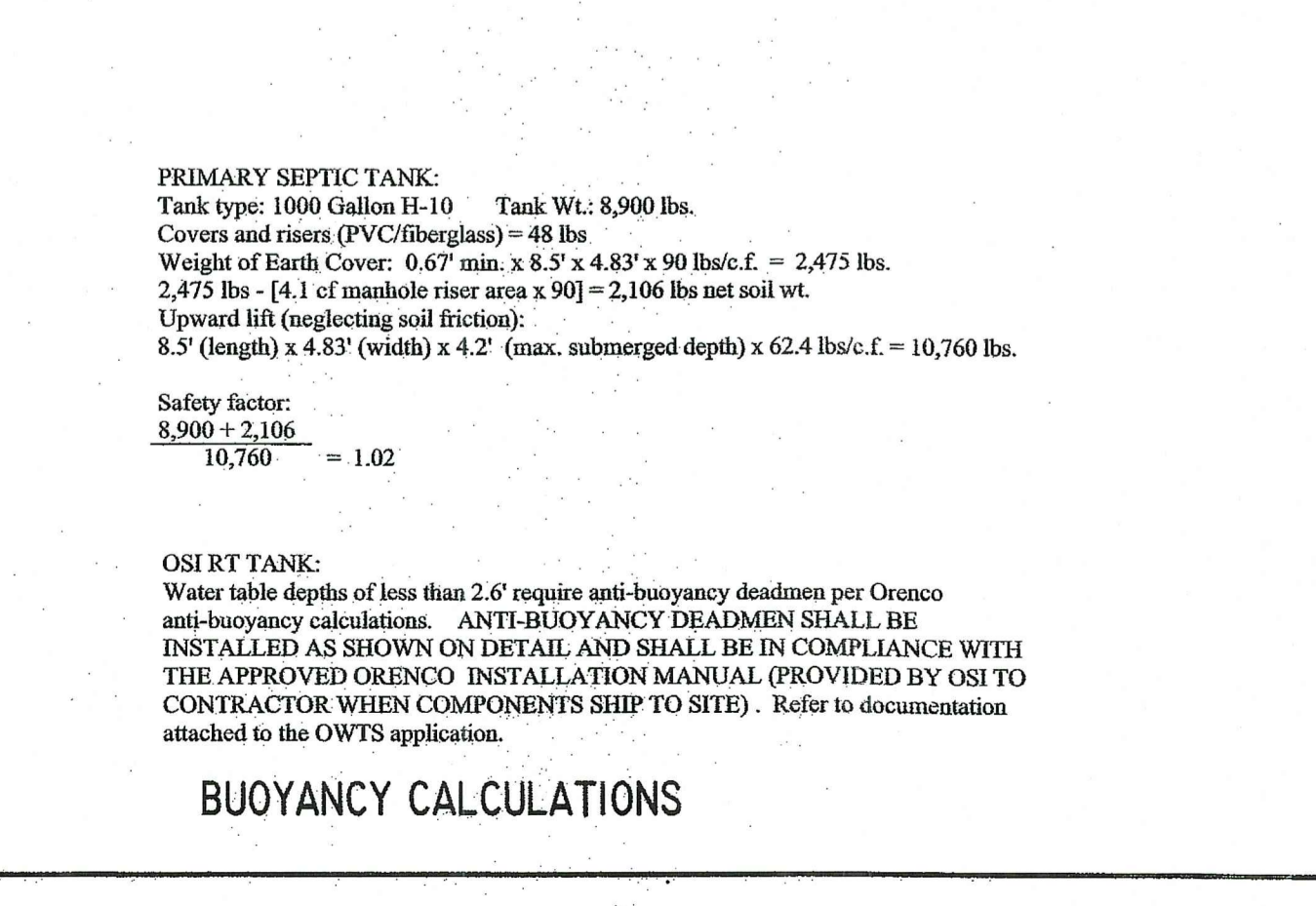
GEOMATRIX GEOMAT 3900 (42" wide) - CLEANOUT ACCESS DETAIL



GEOMATRIX GEOMAT 3900 (42" wide) - CROSS SECTION



GEOMATRIX GEOMAT 3900 (42" wide) - PLAN VIEW



BUOYANCY CALCULATIONS

- GENERAL CONSTRUCTION NOTES:**
- All construction shall conform to RI DEM OWTS regulations 250-RICR-150-10-6; Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems as most recently amended.
 - A high water table, substantial rainfall, 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. Partially installed systems shall be protected from flooding and/or silt accumulation during inclement weather.
 - 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.
 - 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 certified for the installation of selected treatment and disposal system. Dig-Safe notification is required prior to any excavation. Any underground utilities shown are approximate only and are based on limited availability of plans, visual observation, and local knowledge. Verification of installer's certification may be required by the Designer 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.
 - Area to be utilized for the Geomats 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 Geomats.
 - 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 RIDEM 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 tethered 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 floor placement (elevation) shall be at least 1" below the access covers and graded away from the tank to prevent surface water from ponding on and 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 gasket 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 enclosed in suitable conduit with proper fittings at each end to maintain a waterproof connection and prevent transport of vapors/gas from the components to the control panel and building. Electrical installation shall conform to all applicable local/state regulations.

- ADVANTEX AX20-RT SECONDARY TREATMENT UNIT WITH RECIRCULATING MEDIA FILTER:**
- AX20-RT unit ("RT") shall be installed in accordance with the applicable RI DEM regulations and the Orenco Installation Manual provided with the RT unit ("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, unless the RT details specify that anti-buoyancy measures are not required. Refer to deadmen requirement notation directly below AX20-RT Anti-Buoyancy Detail. 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 provided with the RT unit.
 - 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" post, 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 SDR11) 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 and programmable timers
- Control Panel shall be an OSI pump-matched NEMA-4X rated waterproof lockable unit with visual alarms and programmable timer that operates both OSI AX Media Filter pump unit and BSF pump on same circuit. Elapsed time meter and cycle event counter required.
 - Panel to be placed outside on a suitable pedestal near the structure that it serves and within sight of the applicable component access cover(s). 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) 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 cap (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 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. No trees or shrubs are permitted 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.
 - No observed existing (or known proposed) wells located within 200' of proposed OWTS except as shown.
 - No observed existing (or known proposed) Public Wells located within 500' of proposed OWTS.
 - No upgradient drains allowed within 25' of proposed OWTS UNLESS Rule 6.23 B (7), (8), and/or (9) is complied with.
 - No downgradient drains allowed within 50' of proposed OWTS UNLESS Rule 6.23 B (7), (8), and/or (9) is complied with.
 - All observed existing (or known proposed) OWTS within 100' of proposed subject property well are shown.
 - A backup generator (adequate for supplying the pumps in case of electrical failure) is strongly recommended.
 - Property lines as depicted on this plan are approximate only based on Assessor Tax Maps and are not the result of a boundary survey.
 - For proper operation, the septic tank shall be inspected annually and pumped when any solids accumulation exceeds 1/3rd liquid depth.
 - A manufacturer-approved maintenance contract for the pump/filter system is required to be filed in the applicable Town Hall Land Elevation records office. Contract must be kept current as a condition of approval.

Environmental Management
DEC 16 2022
Office of Water Resources

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL
DATED: JUL 14 2023 FILE #: 22-0192
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE
Justin B. Wencel

PROPOSED OWTS - NEW CONSTRUCTION
PREPARED FOR
MARK DEMELLO
ASSESSOR'S PLAT 614 LOT 150
BOUCHARD LANE
TIVERTON, RHODE ISLAND

SCALE: NONE DATE: MARCH 31, 2021

Civil Engineering Concepts, Inc.
34A MAIN STREET P.O. BOX 5323
LITTLE COMPTON, RI 02837 NEW BEDFORD, MA 02742
PH: (401) 592-0177 (508) 990-4900
FAX: (401) 592-0178 EMAIL: wsmithce@aol.com

WILLIAM F. SMITH
REGISTERED PROFESSIONAL ENGINEER
No. 66084

#8/26/22: NO REVISIONS THIS SHEET
REVISIONS:
SHEET 2 of 2 JOB#: 20-031