

- LEGEND**
- EXISTING CONTOUR
 - UTILITY POLE
 - WELL (AS NOTED)
 - SOIL EVALUATION TEST PIT
 - - - APPROXIMATE EDGE OF WETLANDS
 - - - 25' WETLAND BUFFER
 - - - 50' PERIMETER WETLAND
 - - - PROPOSED CONTOUR
 - - - PROPOSED COMPOST FILTER SOCK OR SILT FENCE EROSION CONTROL
 - ○ ○ PROPOSED SCREENING VEGETATION (ROSEBAY RHODODENDRON, 4 TO 5 FEET TALL, 8' ON-CENTER)

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 OWTS & FRESHWATER WETLANDS
 JOINT PERMIT APPROVAL

OWTS# 1933-0421 FWW# 20-0368
 APPROVED: [Signature] DATE 2/10/21
 No Changes Allowed Without RIDEM Approval
 Approved Plans/Permit Must Be Kept at Construction Site

- NOTES FOR 50' PERIMETER WETLAND RESTORATION:**
- 1) THE DISTURBED PORTION OF THE 50 FOOT PERIMETER WETLAND WAS INADVERTENTLY CUT.
 - 2) NO STUMPING OCCURRED AND SPROUTING FROM THE TREE STUMPS IS ANTICIPATED.
 - 3) SCREENING VEGETATION SHALL BE ESTABLISHED ALONG THE PERMANENT LIMIT OF DISTURBANCE. PLANTINGS SHALL BE 4 TO 5 FOOT TALL, ROSEBAY RHODODENDRON (RHODODENDRON MAXIMUM), SPACED 8 FEET ON-CENTER.
 - 4) THE CUT SECTIONS OF THE 50 FOOT PERIMETER WETLAND SHALL BE ALLOWED TO REVEGETATE NATURALLY.

WILLIAM F. SMITH
 No. 00084
 PROFESSIONAL ENGINEER

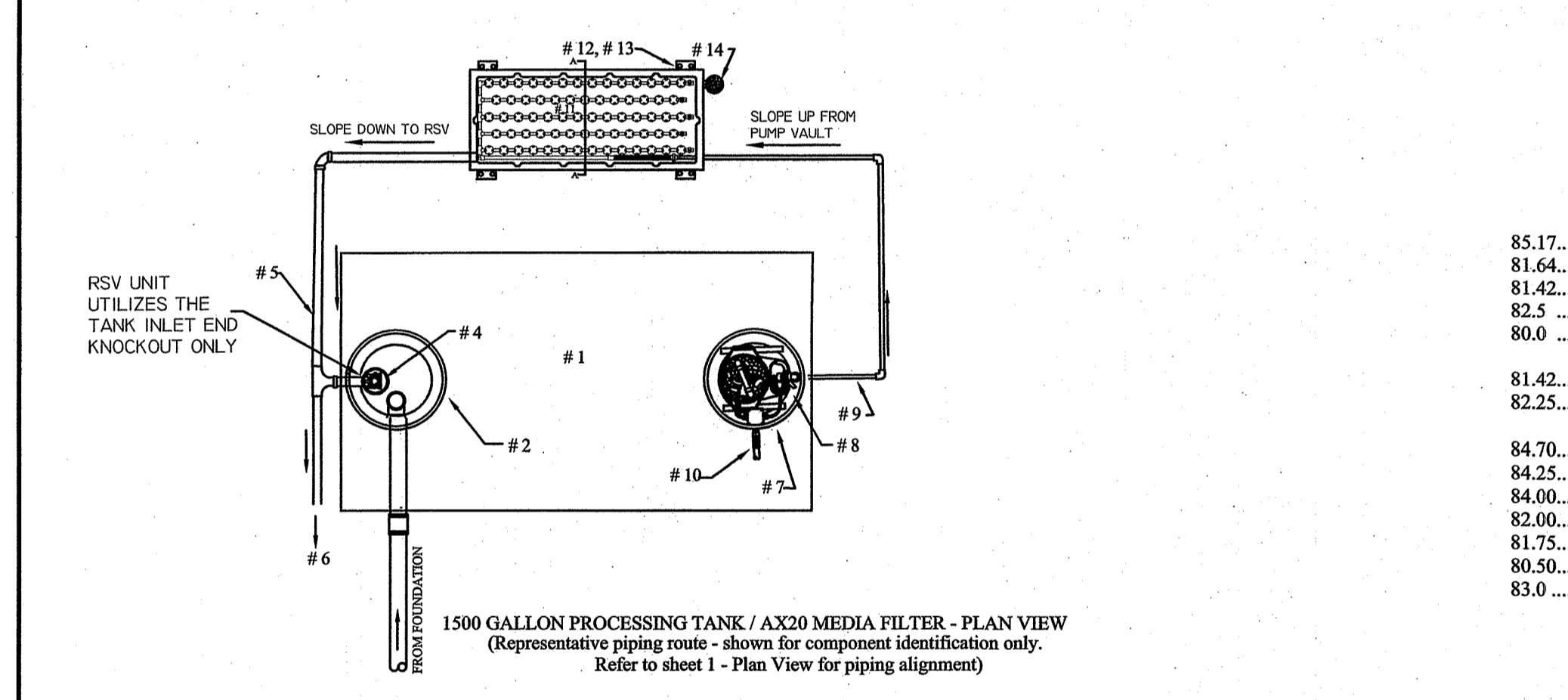
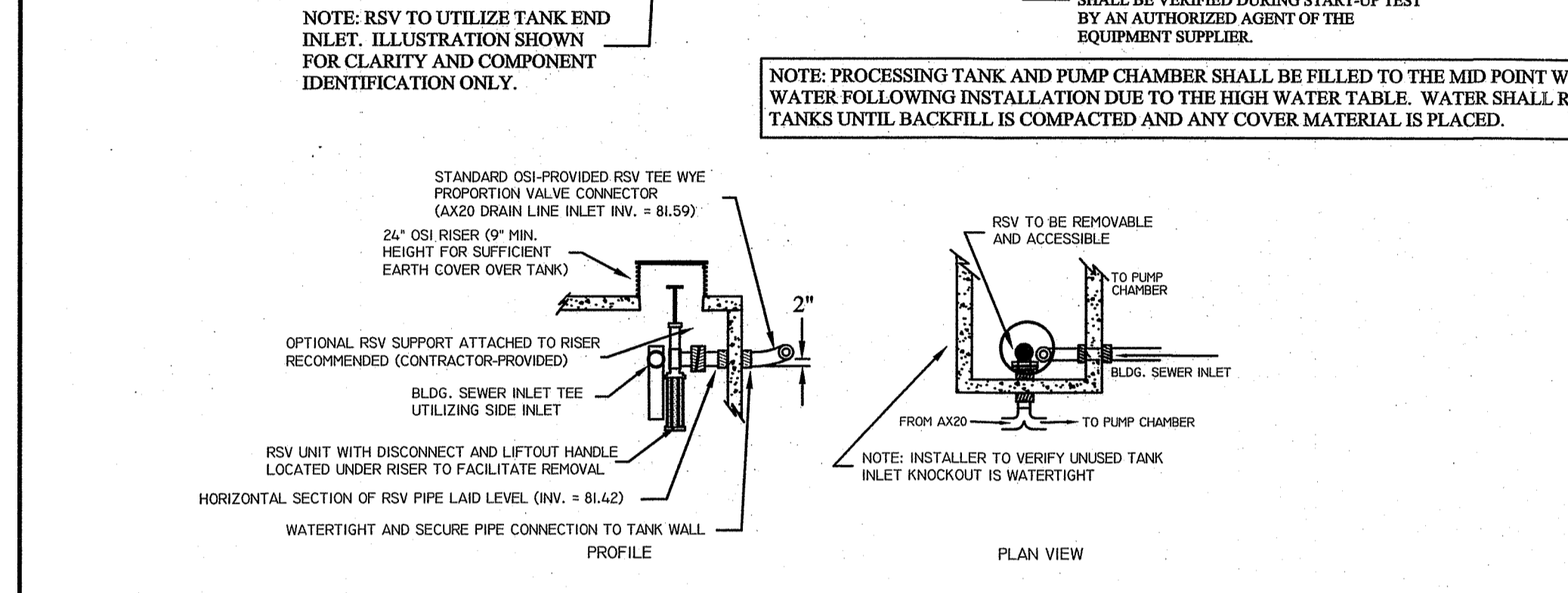
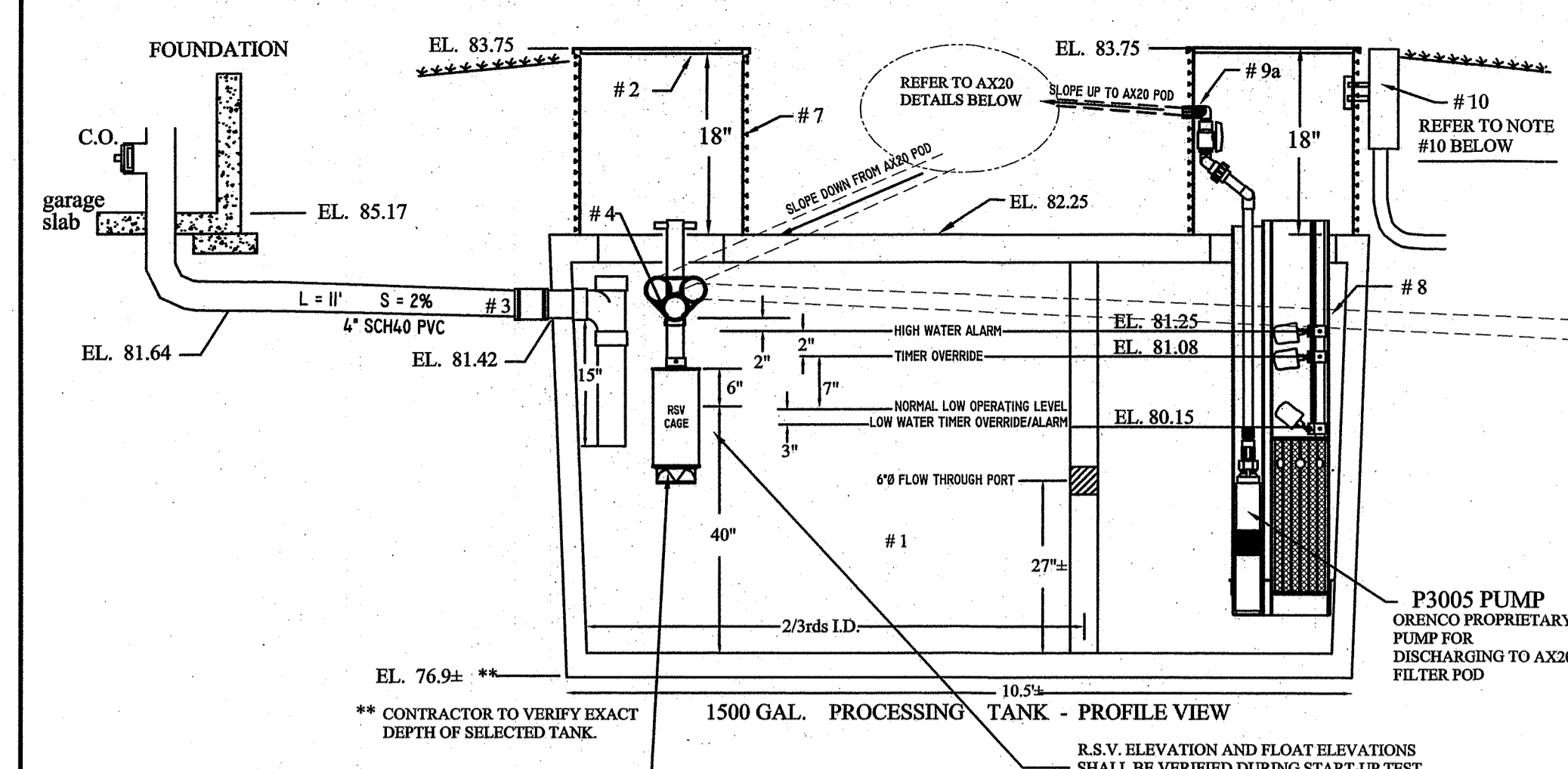
Environmental Management
 DEC 28 2020
 Office of Water Resources

PROPOSED OWTS NEW CONSTRUCTION PLAN
 PREPARED FOR
MASON COSTA
 ASSESSOR'S PLAT 514 LOT 349
 ROY STREET AND HEMLOCK STREET
 TIVERTON, RHODE ISLAND

SCALE: 1" = 20'
 DATE: NOVEMBER 16, 2020

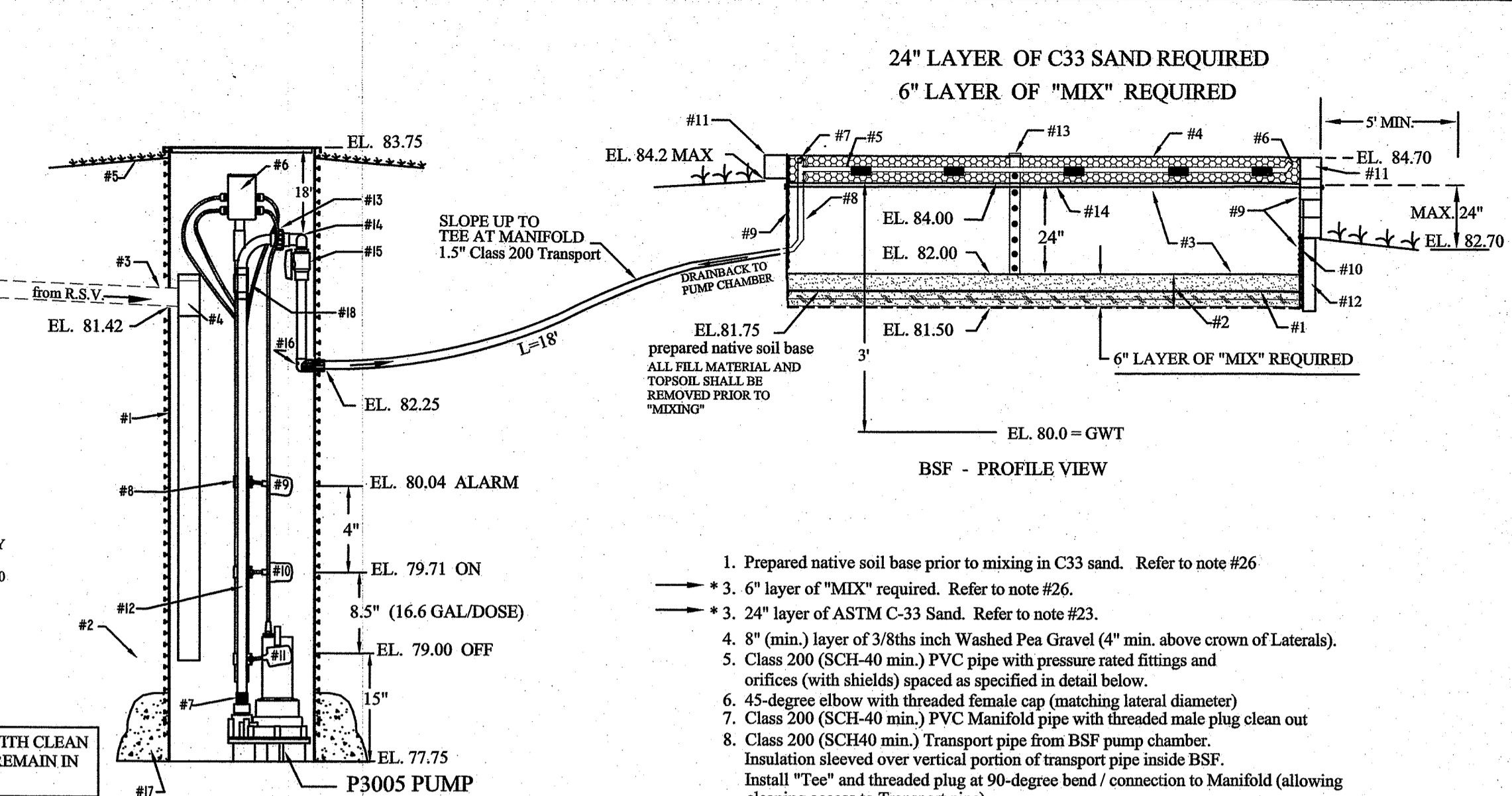
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#1: 12/21/20: PER NRS COMMENTS
 REVISIONS:

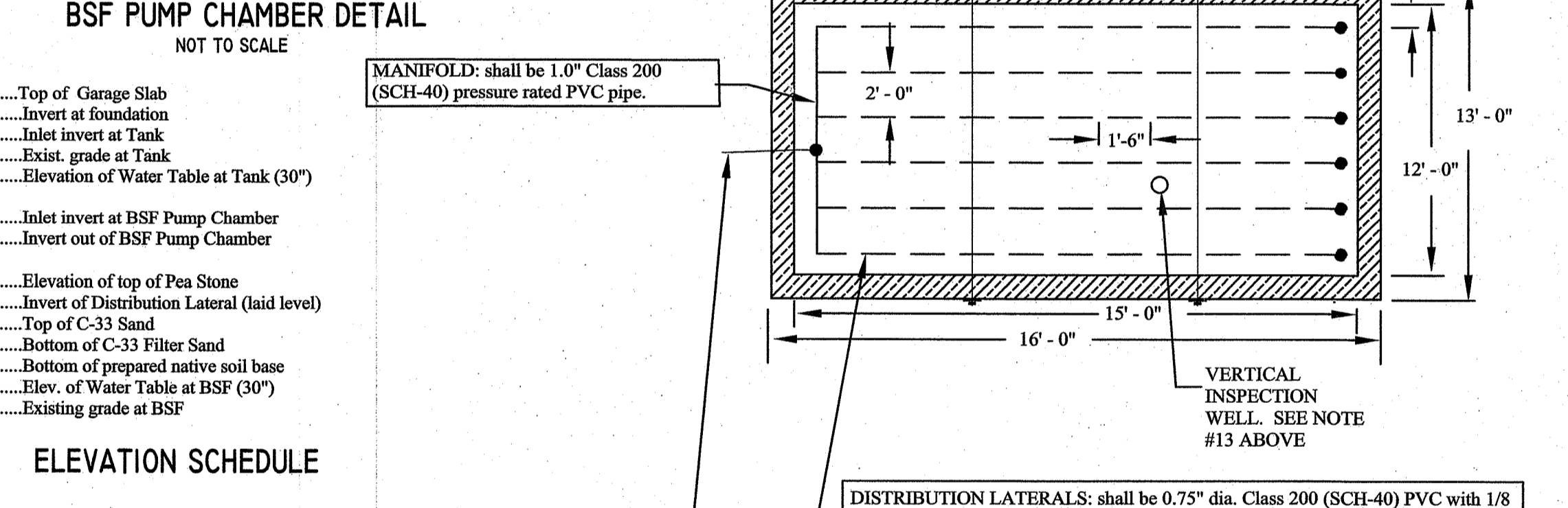


- 1500 gallon H-10 rated Processing Tank with baffle wall.
- 24" dia. OSI PVC inlet riser, w/ fiberglass bolt down cover, on watertight tank adapter.
- 4" SCH-40 PVC building sewer pipe w/ inlet tee.
- Recirculation Splitter Valve (manufacturer specified).
- 2" SCH-40 gravity pipe from AX-20 pod to R.S.V.
- 2" SCH-40 gravity pipe from R.S.V. to B.S.F. pump chamber.
- 24" dia. OSI PVC outlet riser, w/ fiberglass bolt down cover, on watertight tank adapter.
- OSI Biotube recirc. pump package w. OSI PF3005, 1/2 hp, 1" discharge pump.
- 1" Class 200 (SCH40) PVC from Biotube AX pump to AX20 pod.
- Waterproof vapor-proof electrical junction box. Box to be positioned over end of tank to allow for modified conduit sweep.
- Advantex AX-20 recirc. media filter pod.
- Factory installed brackets (1 of 4).
- Contractor installed, factory provided, anti-floatation flanges (1 of 2).
- OSI passive air intake vent.
- 6" x 6" P.T. timber wall (same construction as B.S.F.).
- Compacted clean granular (sand) material.
- 3" layer of mulch or pea gravel extending from top of compacted granular fill up to 1" below AX cover.
- 2 cu. ft. of poured concrete on each of two anti-floatation flanges.

PROCESSING TANK / ADVANTEX AX20 FILTER DETAILS
NOT TO SCALE

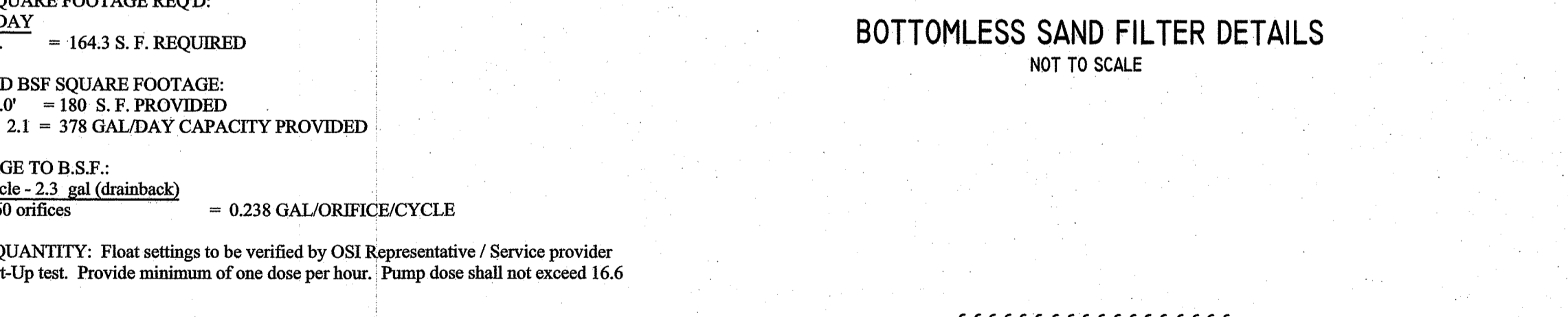


- Prepared native soil base prior to mixing in C33 sand. Refer to note #26
- 6" layer of "MIX" required. Refer to note #26
- 24" layer of ASTM C-33 Sand. Refer to note #23
- 8" (min.) layer of 3/8ths inch Washed Pea Gravel (4" min. above crown of Laterals).
- Class 200 (SCH-40 min.) PVC pipe with pressure rated fittings and orifices (with shields) spaced as specified in detail below.
- 45-degree elbow with threaded female cap (matching lateral diameter)
- Class 200 (SCH-40 min.) PVC Manifold pipe with threaded male plug clean out
- Class 200 (SCH-40 min.) Transport pipe from BSF pump chamber.
- Insulation sleeved over vertical portion of transport pipe inside BSF.
- Install "Te" and threaded plug at 90-degree bend / connection to Manifold (allowing cleaning access to Transport pipe).
- 30 mil. PVC liner.
- 1/2" non-PT plywood vertical support frame below grade.
- 6" x 6" horizontal PT timbers above ground. Note: top of BSF shall be 6" minimum above finished grade. (pictorial representation - not a count of the required timbers).
- 4" x 4" P.T. vertical support timbers to brace 6" x 6" P.T. timber frame construction and non-P.T. plywood frame. Vertical supports required at corners and every 6' o.c.
- 4" dia. filter fabric wrapped perf. SDR-35 inspection well with removable cap 1/2 inch (min) dia. threaded tie rods required when 6" x 6" timbers exceed 2 courses in height (spaced 10' max. o.c.)



ELEVATION SCHEDULE

85.17	.....Top of Garage Slab
81.64	.....Invert at foundation
81.42	.....Inlet invert at Tank
82.5	.....Inlet invert at Tank
80.0	.....Elevation of Water Table at Tank (30")
81.42	.....Inlet invert at BSF Pump Chamber
82.25	.....Invert out of BSF Pump Chamber
84.70	.....Elevation of top of Pea Stone
84.25	.....Invert of Distribution Lateral (laid level)
84.00	.....Top of C-33 Sand
82.00	.....Bottom of C-33 Filter Sand
81.75	.....Bottom of prepared native soil base
80.50	.....Elev. of Water Table at BSF (30")
83.0	.....Existing grade at BSF



NUMBER OF BEDROOMS: 3 - proposed
DESIGN GALLONAGE: 345 GPD
GARBAGE GRINDER: Not Allowed
LEACHING SYSTEM USED: Bottomless Sand Filter
SIZE OF PROCESSING TANK: 1500 gallons
SECONDARY TREATMENT UNIT: Advantex AX-20 Media Filter

SOIL CATEGORY: Soil Category 7
BSF LOADING RATE: 2.1 gal/sd/day, timed dose category 1 L.R.

TOTAL SQUARE FOOTAGE REQ'D:
345 GAL/DAY
2.1 L.R. = 164.3 S.F. REQUIRED

PROPOSED BSF SQUARE FOOTAGE:
12.0' x 15.0' = 180 S.F. PROVIDED
180 S.F. x 2.1 = 378 GAL/DAY CAPACITY PROVIDED

DISCHARGE TO B.S.F.:
16.6 gal/cycle - 2.3 gal (drainback)
60 orifices = 0.238 GAL/ORIFICE/CYCLE

DOSING QUANTITY: Float settings to be verified by OSI Representative / Service provider during Start-up test. Provide minimum of one dose per hour. Pump dose shall not exceed 16.6 gallons.

BASIS OF SANITARY DESIGN

BUOYANCY CALCULATIONS

PROCESSING TANK Tank type: 1500 Gallon H-10 Tank Wt.: 12,500 lbs. Weight of Earth Cover (min. of 15" of soil on tank): 6,685 lbs. Upward lift (neglecting soil friction): 10.5' (length) x 5.66' (width) x 3.1' (max. submerged depth) x 62.4 lbs/c.f. = 11,496 lbs.	BSF PUMP CHAMBER Tank type: OSI 24" dia. PVC unit Tank Wt.: 200 lbs. Weight of Earth Cover: 0 lbs. Upward lift (neglecting soil friction): 1.0' x 1.0' x 3.14 x 3' (max. submerged depth) x 62.4 lbs/c.f. = 588 lbs.
Safety factor: 12,500 + 6,685 = 19,185 19,185 / 1.67 = 11,496	Safety factor: 200 + 700 = 900 900 / 1.5 = 600

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 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 BSF's. 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 BSF shall remain clear of all vehicles, equipment, and stockpiles materials. Contractor shall delineate the BSF area with caution tape to restrict access. Compaction or smearing of native soil will compromise the operation of the BSF.
- 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/RECIRCULATION TANK: Gallonage as specified on Processing Tank Detail

- 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 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. 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 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.
- For additional pump information, see details contained within this plan, accompanying documentation and manufacturers published information provided at the time of pump purchase. The information contained within this plan is intended to provide schematic requirements only. Actual manufacturer's shop drawings are to be coordinated with the component supplier, including accessories such as alarms, floats, etc. that are compatible with the pumps.
- 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/gas from the components to the control panel and building. Electrical installation shall conform to all applicable local/state regulations.

ADVANTEX AX RECIRCULATION MEDIA FILTER:

- The AX pod shall be laid level on a 5" (min) thick bed of compacted sand/gravel. When installed above the processing tank, it is recommended that a frame of non-P.T. 2" x 6" lumber be constructed on top of the processing tank to support the sand/gravel, preventing material washout from under the AX pod.
- Proper compaction of well-drained granular material under, along side, and above the four anti-floatation flanges is necessary to ensure the pod will not float. If concrete ballast is specified on plan, compacted material under and along side of the flanges is required to support the concrete.
- Hand compaction of backfilled material around the AX pod and related piping is required to prevent settlement and air pockets that may fill with water resulting in floatation.
- All piping connected to the AX unit shall be Class 200 (SCH-40 or SDR-21) pressure rated piping with pressure rated fittings (no DWV-type fitting permitted).
- The Passive Air Vent shall be located less than 15' from the AX pod. 2" SCH-40 PVC connector pipe shall slope down from vent to pod to allow draining. Bottom of the perforated intake shall be 12" minimum above finished grade.
- Any specified courses of 6" x 6" P.T. timbers surrounding the pod shall be constructed the same as the B.S.F. timber frame. Compacted well-drained granular soil required below timbers. Timbers shall extend past the sides & ends of pod to allow for vent, plumbing, and flanges.
- Mulch or pea stone shall be placed between the pod and the timbers, extending to the top of the timbers.
- Finished grade shall slope down and away from the cover to prevent surface water from ponding on and entering the cover.

BSF PUMP SYSTEM:

- OSI PVC pump chamber. Any weepholes shown shall not be directed toward floats. Pump floats shall be controlled by the septic/recirculation tank Biotube Pump Vault Control Panel. Discharge piping shall be equipped with an anti-siphon valve only when the BSF is located below the pump chamber "OFF" float elevation. Final loam placement (elevation) shall be at least 1/2" below the fiberglass/PVC access cover and graded away from chamber to prevent surface water from ponding on and entering the cover.
- Transport line shall be Class 200 pressure rated piping (with pressure rated fittings) laid at consistent slope up to the BSF Manifold to allow for drainback. Refer to adjacent BSF details for any site-specific pipe insulation or burial depth requirements. Transport pipe shall be threaded onto pump basin's flexible discharge pipe. 1 cu. ft. (min) concrete thrust blocks required at all angle points. All piping through pump chamber shall utilize secured flexible rubber seals.
- BSF pump(s) shall be as specified. Any pump substitution shall require the Designer's review of the substitute pump specifications and pump curve.
- BSF pump calculations input data/pump curve is provided on attachment with application. Lateral lengths & manifold lengths used for pump specifications reflect that piping does not extend to the far edges of the BSF filter box.

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, mounted on P.T. posts near the structure that it serves (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.

BOTTOMLESS SAND FILTER (BSF):

- A start up test is required to be performed by the Installer/Maintenance provider and witnessed by the Designer of the AX pumping system, the BSF pumping system, and the pressure (head) testing of the BSF laterals. Any subsequent electrical work shall include the Electrician's verification to the Maintenance provider that the electricity is properly restored to the Control Panel.
- BSF shall be constructed as shown with materials as specified in the details. Installation of a 4" dia. perforated (filter fabric wrapped) inspection well, section 2.1.5.2(a) and Figure 14 for ASTM C33 SAND AND SHALL HAVE AN EFFECTIVE SIZE (D10) OF 0.33 mm= AND UNIFORMITY COEFFICIENT (D60/D10) OF 3.0 TO 4.0, WITH A MAXIMUM OF 1% FINES PASSING A NUMBER 200 SIEVE. Designer may require sieve analysis from sand supplier within 3 days prior to sand delivery. Sand shall be installed in 8' lifts, "walked down" using foot pressure (no compaction) per RI DEM requirements.
- Manifold and Distribution lateral: dia. specified on detail and shall be Class 200 PVC with 1/8" orifice holes (drilled with a new bit) and fitted slotted cold weather orifice shields spaced at intervals specified. Laterals shall be laid level. Distal ends of laterals shall be equipped with a 45-degree elbow and 3/4" or 1" threaded female end cap. Sweep elbows extending to the surface are not to be installed on ends. All fittings shall be pressure rated (DWV fittings not acceptable).
- An inspection well (vertical, filter fabric wrapped 4" perforated PVC w/ cover) is required to be installed in the BSF.
- Leaching area excavation shall be level and scarified. Care shall be taken to avoid compaction of remaining soil. Excavation of native material below the BSF shall only be to the extent designated on the plan. Sod, vegetation, dead/decomposing organic litter and any organic soil horizon (unsuitable "A" horizon material) shall be removed from the footprint of the BSF. Prepared native soil surface shall be inspected by the Designer prior to mixing of 3" of C33 into the native soil. Mixing shall extend a minimum of 3' into the native soil base (total of 6" combined mixed layer).
- Above ground BSF support framing shall consist of 6" x 6" pressure treated timbers drilled and pinned to the soil with #3 or #4 rebar and screwed/nailed together at the corners and joints. Below ground construction shall utilize 1/2" min. thickness non-P.T. plywood in place of timbers. 30 mil. liner shall be placed inside timbers and plywood. Vertical 4" x 4" timbers (to support 6" x 6" frame) required with three at each corner and one every 10' on center. (max).
- Where more than two courses of 6" x 6" timbers are exposed, 1 1/2" dia. threaded galvanized rods with 2" dia. galvanized washers and nuts shall be installed in the second timber down from the top (to support timbers from bowing out), evenly placed along the length of BSF (approximately 12' o.c.).
- Trees or shrubs shall not be planted within 10' of the BSF without vertical placement of a suitable root barrier fabric installed at least 3' beyond the BSF and extending from 4" below finished grade to 1' below the bottom of the native soil/BSF sand interface.
- Heavy equipment shall not be operated over the components or the prepared leaching area during installation. Rubber tread machinery is not to be driven over the prepared natural soil base or sand/stone bed during system installation.
- BSF is not to be covered with topsoil or any other type of cover material that will restrict air flow. Any accumulated weeds, grass, or foreign material on the filter shall be removed by hand labor. Pea gravel surface must remain fully exposed to atmosphere.
- All observed existing (or known proposed) wells within 200' of proposed OWTS are shown. All observed existing (or known proposed) public wells within 500' of proposed OWTS are shown.
- All observed existing (or known proposed) OWTS's within 100' of subject property well are shown.
- 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.
- No parking is permitted in the vicinity of the OWTS.
- 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.
- 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 Evidence records office. Contract must be kept current as a condition of approval.

PROPOSED OWTS NEW CONSTRUCTION PLAN
 PREPARED FOR
MASON COSTA
 ASSESSOR'S PLAT 514 LOT 349
 ROY STREET AND HEMLOCK STREET
 TIVERTON, RHODE ISLAND

SCALE: NONE DATE: NOVEMBER 16, 2020

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WILLIAM F. SMITH
 No. 12/21/20: NO REVISIONS THIS SHEET
 REVISIONS: SHEET 2 OF 2

JOBS: 19-026