

LOCUS MAP

ELEVATION SCHEDULE	
1. SEWER LINE AT FOUNDATION	90.29
2. ADVANTEX TANK INLET	89.19
3. ADVANTEX TANK OUTLET FROM FILTER	89.19
4. PUMP CHAMBER INLET	89.64
5. PUMP CHAMBER OUTLET	89.64
6. SAND FILTER INLET	91.25
7. BOTTOM OF SAND FILTER	89.89
8. GROUND WATER ELEVATION	86.10

ADVANTEX SEPTIC TANK	
1. HIGH WATER ALARM/OVERRIDE TIMER	89.75
2. NORMAL LOW LEVEL	89.00
3. LOW WATER ALARM/REDUNDANT OFF	81.87

**LID IMPERVIOUS SURFACE**  
**STORMWATER INFILTRATION DESIGN**  
 New roof areas: (1) House; 32' x 48' = 1536 sf  
 (2) Garage; 24' x 24' = 576 sf  
 Total: 2112 sf  
 Rain garden designs; 8" deep; connect roof downspouts to the rain gardens (see typical rain garden detail).  
 #1- Garage; per regulation table 8; design @ 600 sf (96 sf required)  
 8' wide x 12' long = 96 sf  
 #2 & #3 House; per regulation each design @ 800 sf (128 sf required)  
 8' wide x 16' long = 128 sf

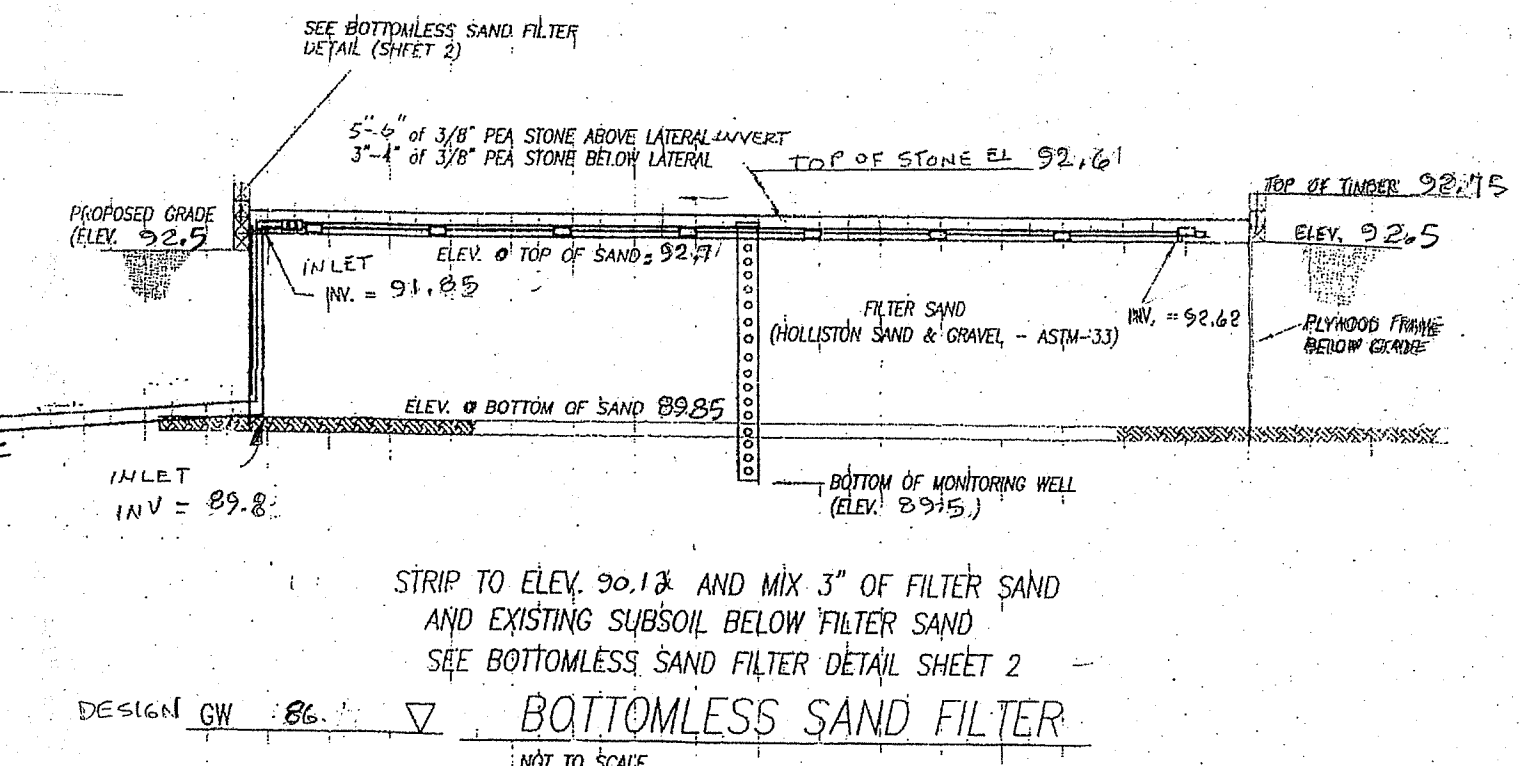
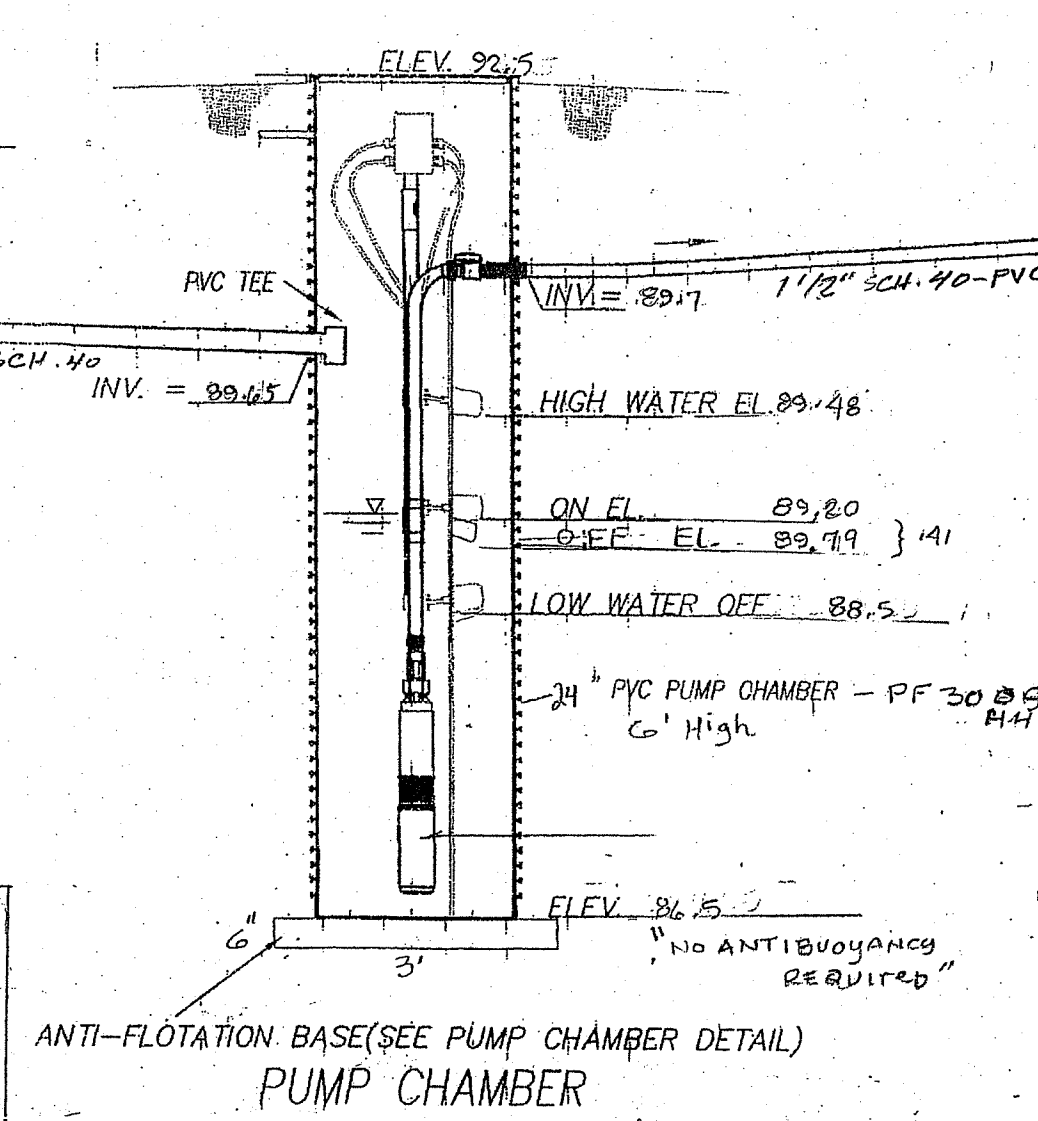
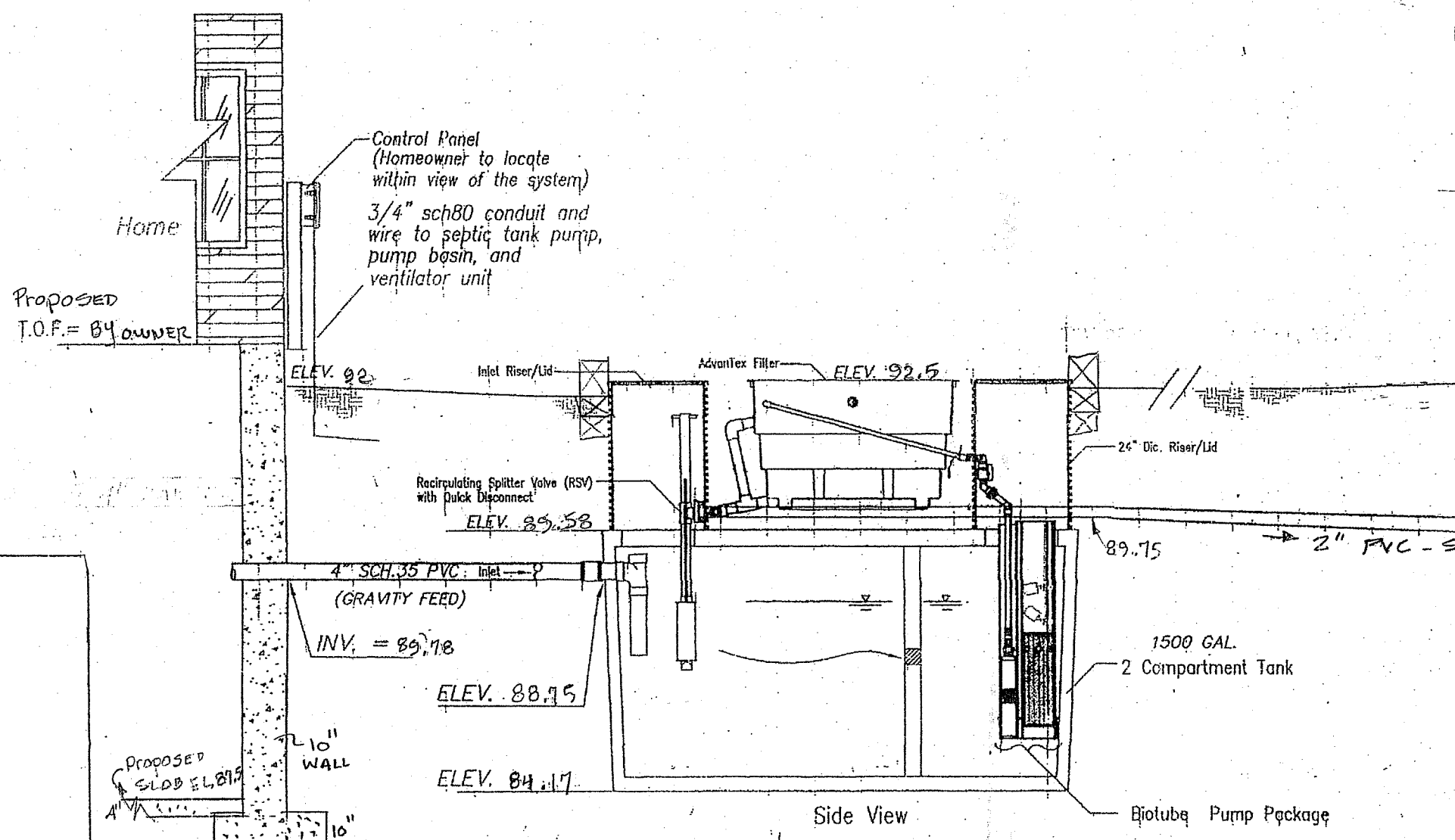
**PLANTING SCHEDULE**

LETTER	QUANTITY	PLANT SPECIES
A	3	SWEET PEPPERBUSH
B	5	SWEET FERN
C	3	BAYBERRY
D	3	HIGHBUSH BLUEBERRY
E	1	BUTTERFLY MILKWEED
F	1	BLUEFLAG IRIS
G	1	BEARBERRY

**EROSION CONTROL NOTES**

- Prior to any construction or earthwork activity, a line of staked haybales and/or silt fencing shall be placed as shown on the plan and maintained throughout the construction process.
- All disturbance is to be limited to the areas shown, and is to be kept to a minimum.
- All excavated materials (soil) to be used as backfill shall be stocked piled and shall be surrounded by silt fencing.
- All excess unwanted materials shall be removed from the site.
- All disturbed areas and final grading shall be loamed and seeded.
- All slopes shall be stabilized with straw mulch.
- All silt fence and mulch shall remain until grass has properly rooted.

- REFERENCES:**
- Lot survey, topography 7 wetland fluffing location by: Steven Pinch, PLS.
  - Wetland flagging & DEM verification report by: Natural Resource Services, Inc; DEM application # 18-0147.
  - Soil Evaluations by: David Kalen, D-4052



TYPICAL CROSS-SECTION

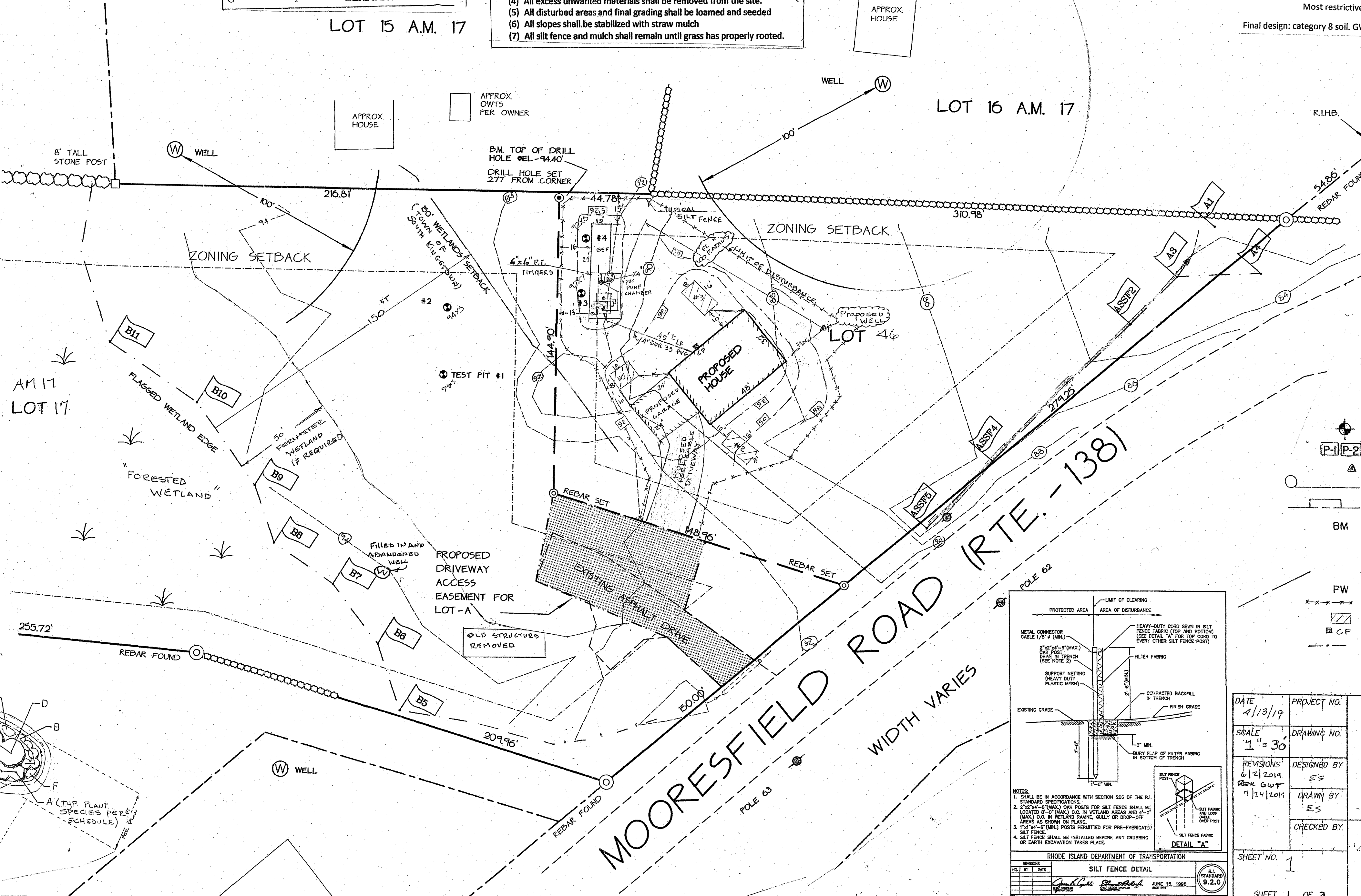
**ground water & soil determinations**

Test Hole #3: grade @ test pipe: El. 92.7; original grade: El. 91.1; GWT: 91.37-95 = 86.37  
 Min. top of BSF sand = 86.37+3' = 89.37  
 M.W. Bottom of sand (APD base) = 87.12 = 87.12  
 Most restrictive soil design El. = 85.87 Per "soil evaluation" category 8

Test Hole #4: grade @ test pipe: El. 92.; original grade: El. 90.73; GWT: 90.93-95 = 85.93  
 Min. top of BSF sand = 85.93+3' = 88.93  
 M.W. Bottom of sand (APD base) = 84.92 = 84.92  
 Most restrictive soil design Per "soil evaluation" category 8

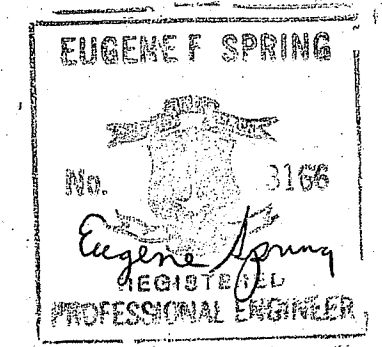
Final design: category 8 soil GWT (highest gwt) El. 86.37 design @ 26.37

- GENERAL NOTES**
- The contractor shall verify the location of all utilities and contact DIG-SAFE prior to construction. All permits shall be responsibility of the owner. The contractor shall contact the utility companies, if necessary, to make alterations or relocations of the utilities.
  - The contractor shall be responsible for maintenance of the integrity of all existing utilities, structures, etc. for abutting properties.
  - All unwanted materials shall be removed from the site by the contractor.
  - Refer to the ISDS notes for other information.
- ISDS NOTES**
- The proposed system shall consist of a leaktight, two-compartment 1500 gallon septic tank from Jolly Precast and houses an ORENCO AdvanTex - AX Treatment System (Mode 3B). The second compartment shall have an Orenco recirculating pump with biotube filter as shown on the profile. The installation shall be in accordance with the manufacturers instructions. The complete system shall be equipped with an hour meter and audible and visual alarms to indicate power interruption or loss. This alarm system is to be mounted on a NEMA approved cabinet on the exterior of the building. A 24" diameter ORENCO pump chamber will pump the AdvanTex discharge liquid to a ORENCO bottomless intermittent sand filter of the size shown on the plans. Control is by demand float arrangement.
  - The owner shall assure that proper electrical capacity is available for the system requirements.
  - The contractor shall install the components under the supervision of the designer, and the manufacturer's representatives. The contractor shall maintain documentation verifying the minimum dimensions of the tank as well as its structural integrity.
  - All installation shall be performed by a licensed ISDS installer.
  - All system testing shall be conducted and verified by the designer and ORENCO Representative(s). Final system acceptance shall be based on the testing results and/or corrected operation as verified by the vendor and the engineer.
  - All system components shall be verified to be correct by the ORENCO representative prior to installation.
  - There are shown existing or proposed wells within 200 ft. of the proposed ISDS. There are no public wells within 400 ft. of the proposed ISDS.
  - There shall be no traffic allowed on the system; grades to be maintained are shown on the plan. Filter to be installed when ground water conditions are deemed low enough. There are no drains within 25 ft. of the system. None proposed.
  - The bottomless sand filter shall be installed in accordance with all notes; to the specified elevations on the plan and shall require DEM inspection and designer inspection prior as required by the DEM approval.
  - The owner shall be required to sign a maintenance contract agreements with the Orenco maintenance vendor. The contract will be for system maintenance by an approved service company for a minimum of two years. The documents shall be recorded in the Town hall land evidence records and a copy submitted to DEM prior to system conformance. Maintenance will be performed for the life of the system. See other notes for the installation and maintenance of the systems.
    - All warranties of the components are as presented by the companies involved.
    - No garbage disposal is allowed.
    - All items required by DEM for inspection are circled on the application sheet (installer take note)
    - Low water volume fixtures shall be used in the house.

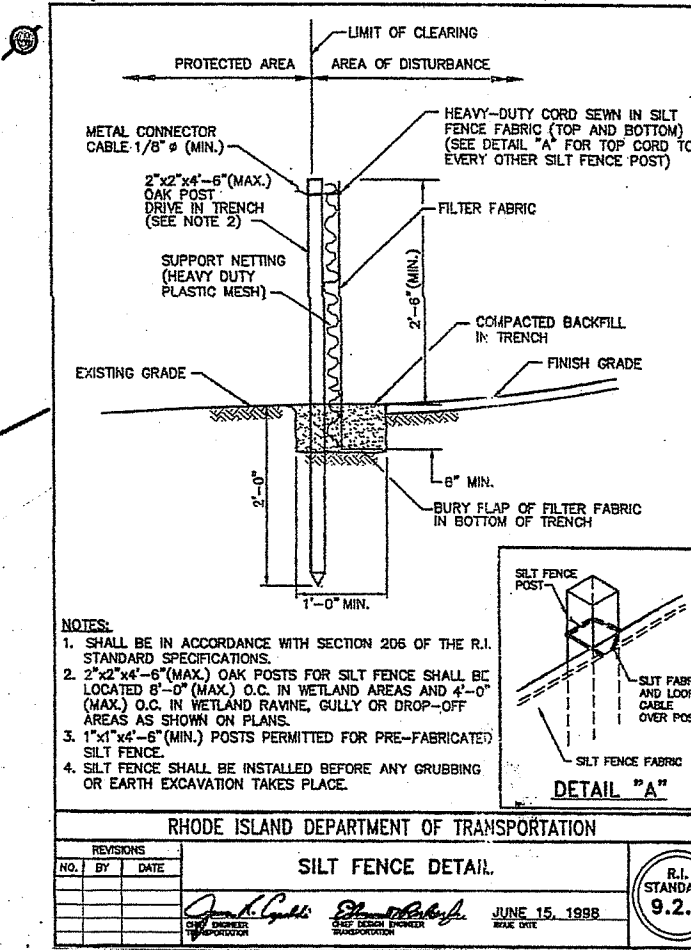


Daily Flow: 4 bedrooms @ 115 gpd = 460 gpd  
 Hydraulic loading; category 8 BSF = 1.9 gal/sf  
 Minimum area: 460/1.91 = 242.1 sf  
 Provided area; 10' x 25' = 250 sf

Timed Dosing: .5 hr cycle or 48 doses per day  
 Volume per dose: 460/48 = 9.58 gal/dose  
 Pump Chamber (on/off) dose float differential  
 24" diameter pump chamber height per ft volume:  
 $V = 3.14 \times (2' \times 2') / 4 \times 1' = 3.14 \text{ cf} \times 7.48 \text{ gal/cf} = 23.49 \text{ gal/ft of height}$   
 on/off differential = 9.58/23.49 = 41 ft.



- LEGEND**
- Water Table Test
  - Percolation Tests
  - Proposed Well Location
  - Existing Contours
  - Finish Contours
  - BM = Bench Mark - TOP OF DRILL HOLE
  - Elevation 94.40
  - "Do Not Disturb"
  - Proposed Water Line
  - SILT FENCE (LIMIT OF DISTURBANCE)
  - RAIN GARDEN
  - CONTROL PANEL
  - WETLAND AS FLAGGED



DATE: 4/13/19	PROJECT NO.:	PROPOSED SEWAGE DISPOSAL SYSTEM FOR 1832-0710
SCALE: 1" = 30'	DRAWING NO.:	AP 11
REVISIONS: 6/2/2019	DESIGNED BY: ES	Lot 46 (Formerly Lot A)
7/14/2019	DRAWN BY: ES	901 MOORESFIELD ROAD SOUTH KINGSTOWN
	CHECKED BY:	OWNER: SMP LENDING LLC + KW
		WETLAND APPLICATION # 19-0163

Office of Water Resources  
 Environmental Management  
 2.9.2019

NOTE: NEWLY RECORDED LOT # 15 & 46

Copy of permit and operation Maintenance contract must be filed in land evidence records prior to conformance

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

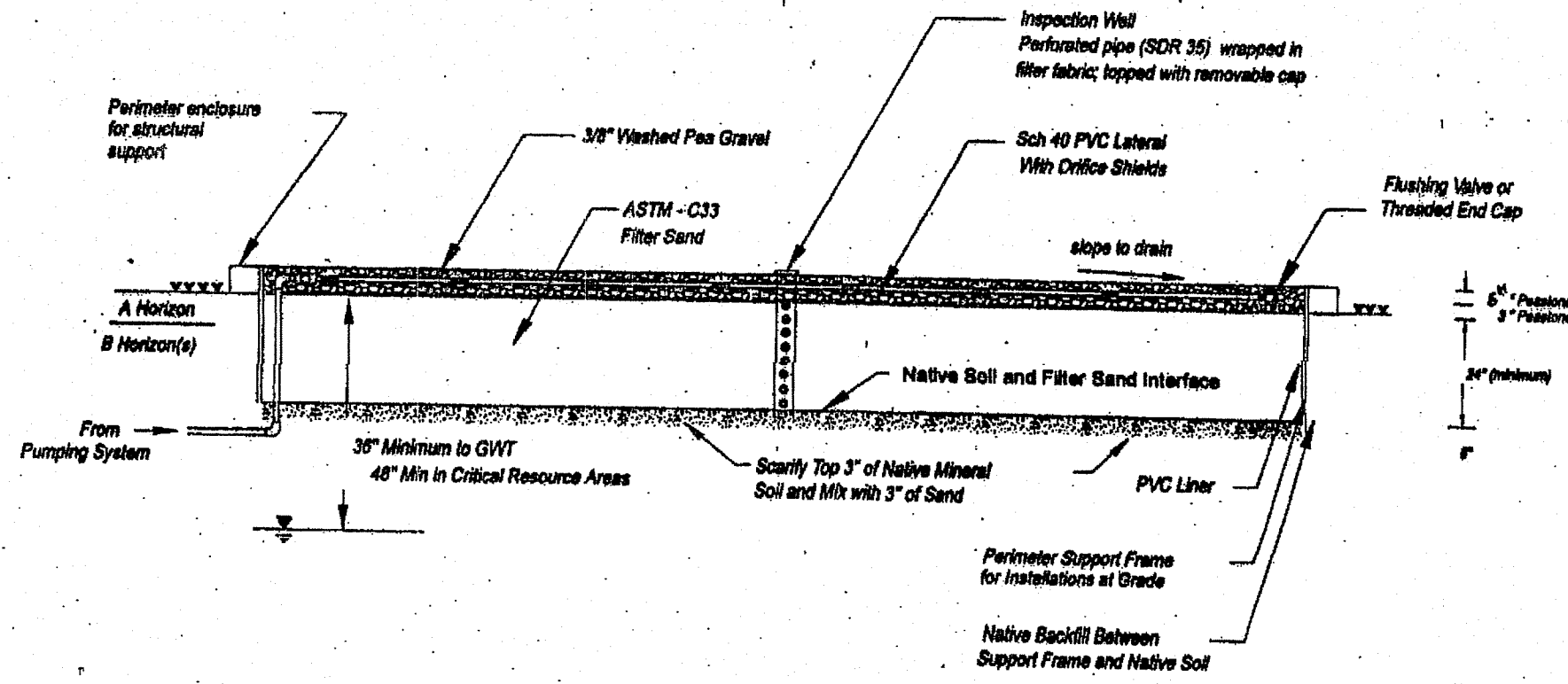
OWT&S 1832-0710 RWMA 19-0163  
 APPROVED: [Signature] DATE: 8/1/19  
 No Changes Allowed Without RIDEM Approval  
 Approved Plans/Permit Must Be Kept at Construction Site

**BOTTOMLESS SAND FILTER GENERAL NOTES**

1. THE BOTTOMLESS SAND FILTER (BSF) SHALL BE INSTALLED BY A QUALIFIED LICENSED INSTALLER. THE INSTALLER SHALL BE FAMILIAR WITH THE REQUIREMENTS AND INFORMATION OF THE "GUIDELINES FOR THE DESIGN AND USE OF THE BSF REFERRED TO AS THE "SAND FILTER GUIDANCE DOCUMENT ISSUED BY THE DEPT. OF ENVIRONMENTAL MANAGEMENT (RIDEM) AND AS MODIFIED.
2. THE DESIGNER SHALL BE GIVEN ADEQUATE NOTIFICATION FROM THE INSTALLER TO PROVIDE PROPER INSPECTION OF THE BSF STRUCTURAL SUPPORT SYSTEM, LINER, ASTM C33 SAND MEDIA MATERIALS, SYSTEM PIPING AND PEASTONE MEDIA, ETC.
3. PRIOR TO DELIVERY OF SAND MEDIA AND PEASTONE MEDIA MATERIALS, THE INSTALLER SHALL PROVIDE THE DESIGNER WITH INFORMATION OF THE MATERIAL, SOURCE AND SEIVE ANALYSIS TO ASSURE THAT THE MATERIALS MEET THE REQUIRED GRADATION SPECIFICATIONS SHOWN ON THE PLAN AND AS SPECIFIED IN THE SAND FILTER DOCUMENT. ALL MEDIA WITHIN THE STRUCTURAL ENCLOSURE AND BELOW THE PEASTONE MUST MEET THE REQUIREMENTS OF THE ASTM-C33 SAND WITH AN EFFECTIVE SIZE (D-10) OF .3MM AND UNIFORMITY COEFFICIENT (D60/D10) OF 3 TO 4. THE MAXIMUM ALLOWABLE FINES PASSING THROUGH A #200 SIEVE ANALYSIS PERFORMED SHALL BE 1%. THE DESIGNER AND OR PROPERTY OWNER SHALL HAVE THE RIGHT TO REQUEST SIEVE TESTING. ONLY AUTHORIZED VENDORS SUPPLYING THE MATERIALS WILL BE ALLOWED TO DO SUCH.
4. THE BSF MUST BE USED IN CONJUNCTION WITH THE APPROVED PRETREATMENT SYSTEM SHOWN ON THE PLANS AND DETAILS.
5. THE PREPARED BOTTOM OF THE EXCAVATION SHALL BE INSPECTED BY THE DESIGNER AND/OR DEM PRIOR AND APPROVED TO CONSTRUCTION OF THE STRUCTURAL SUPPORT ENCLOSURE AND PLACEMENT OF ANY MEDIA.
6. THE BSF AREA LANDSCAPE IMMEDIATELY ADJACENT TO THE BSF SHALL BE PROTECTED FROM VEHICLE TRAFFIC OR HEAVY LOADS.
7. THE FINISH GRADE OF ANY BSF SHALL BE AS SHOWN ON THE REGRADING DETAIL.
8. THE DESIGNER WILL AID IN THE STAKEOUT OF THE BSF AND REGRADING AREA PRIOR TO CONSTRUCTION.
9. A MINIMUM OF 10 FT SHOULD BE MAINTAINED AROUND THE BSF AND ALL SHRUBS AND TREES. AT LOCATIONS WHERE IT IS NOT POSSIBLE, THEN A ROOT BARRIER SYSTEM SHALL BE PLACED BETWEEN THE ROOTS AND BSF.
10. THE PUMP SYSTEM DESIGNED TO DOSE THE BSF IS INCLUDED ON THE PLANS. NO SUBSTITUTE OF THE REQUIRED PUMP WILL BE ALLOWED UNLESS THE PUMP PROVIDE THE REQUIRED DOSING AND DISTEL HEAD MINIMUM (2 FT). PRIOR APPROVAL IS REQUIRED FROM THE MAINTENANCE VENDOR, DEM AND THE DESIGNER.
11. THE EFFLUENT TRANSPORT LINE FROM THE PUMP TO THE BSF MUST BE PROVIDED WITH A BACKSLOPE TO THE PUMP CHAMBER. NO CHECK VALVES ARE ALLOWED. THE PIPE SHALL BE BURIED AT LEAST 2 FT. AND COVER WITH A 2 FT. WIDE BY 2" THICK INSULATION BOARD BELOW THE BACKFILL.
12. ALL PENETRATION THROUGH THE 30 MIL LINER SHALL BE SEALED WITH THE APPROVED BOOT. THE BOOT SHALL BE INSPECTED BY THE DESIGNER AND/OR DEM PRIOR TO COVERING. ALL CONCRETE ANTI-FLOATATION AROUND THE PUMP CHAMBER OR TANKAGE SHALL BE PERFORMED AFTER PROPER DEWATERING HAS BEEN ACCOMPLISHED BY THE INSTALLER AND VERIFIED BY THE DESIGNER. ALL TANKS AND CHAMBERS IN HIGH GROUND WATER AREAS SHALL BE FILLED WITH CLEAN WATER IMMEDIATELY AFTER INSTALLATION.
13. THE DISTRIBUTION MANIFOLD, PIPING AND DISTRIBUTION PIPING SHALL CONFORM TO THE PLAN. THE ORIFICE SHIELDS SHALL BE PLACED AS SHOWN. NOTE THE COLD WEATHER ORIFICE SHIELD LOCATION AND POSITIONING. NOTE THE INSTALLATION OF THE INSPECTION PIPE WRAPPED WITH FILTER FABRIC.
14. NOTE THE STRIP REQUIREMENT (IF SHOWN) AND THE SOIL INTERFACE SCARIFICATION AND MEDIA MIXING WITH THE REQUIRED SOIL (3") BELOW THE SAND FILTER BOTTOM ELEVATION.
15. THE INSTALLATION OF THE SAND MEDIA SHALL BE AS DESCRIBED IN THE SAND FILTER DOCUMENT, PLACED CAREFULLY AND IN 8" LIFTS, RAKED AND LEVELED. AVOID STRATIFICATION. DO NOT INSTALL IF RAIN IS FORECASTED. THE DESIGNER MUST INSPECT PRIOR TO ADDING THE PEASTONE MEDIA.
16. THE INSTALLER SHALL COORDINATE THE ELECTRICAL WORK. NO TESTING SHALL BE MADE PRIOR TO HAVING THE MAINTENANCE VENDOR PRESENT AND COORDINATING THE STARTUP OF THE SYSTEM WITH THE VENDOR AND THE DESIGNER.
17. AFTER PROPER OPERATION HAS BEEN ESTABLISHED, THE MAINTENANCE VENDOR SHALL PROVIDE ALL OF THE PROPER SIT VISITS TO TAKE THE REQUIRED MEASUREMENTS FROM THE CONTROL PANEL (EVENT COUNTS, WATER METER COUNTS, ON/OFF TIMES, ETC. BSF DISTAL END HEAD MEASUREMENTS, ETC. THE VENDOR SHALL NOTIFY THE ENGINEER WITH ANY CHANGES OR DEVIATIONS NEEDING TO BE CHANGED OR CORRECTED.

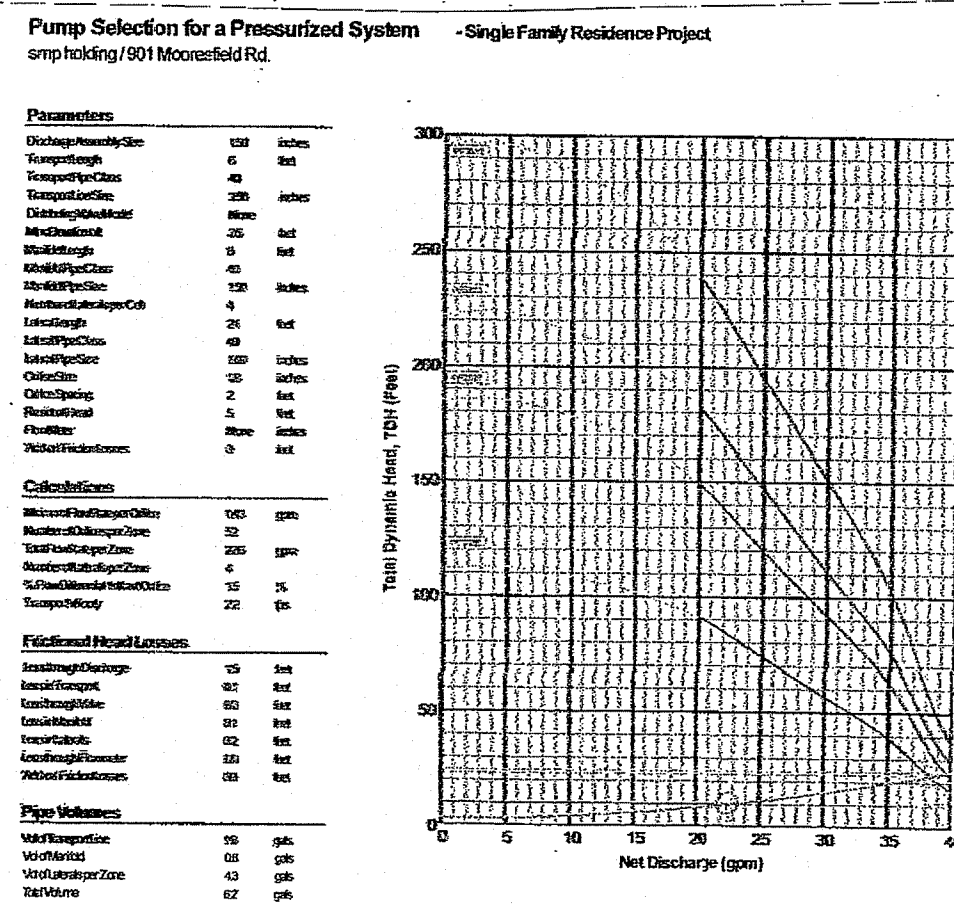
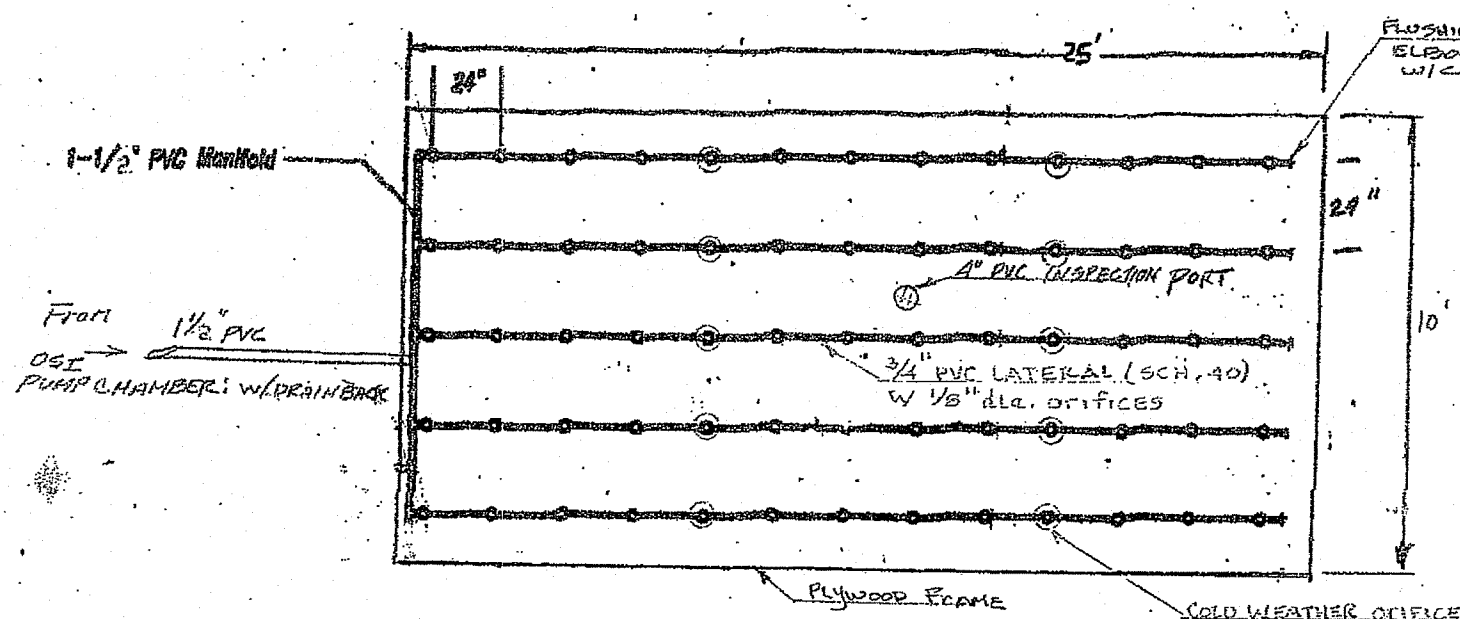
**Buoyancy Calculations**

(1) Septic Tank, 1500 gallon  
 Tank Weight: 12,200 #  
 Tank Displacement per ft. of height:  
 Volume: 5.67' x 10.5' x 1' = 59.35 cf  
 Water displacement per ft of height (#) = 59.35 x 62.4 #/cf = 3691.17 #  
 Depth of tank into groundwater:  
 Bottom of tank: El: 84.17 ; GWT @ El: 86.37  
 Depth into GWT = 2.2 ft.  
 Buoyancy = 2.2 x 3691.17 = 7382.34 #  
 OK 7382 < 12,200 #

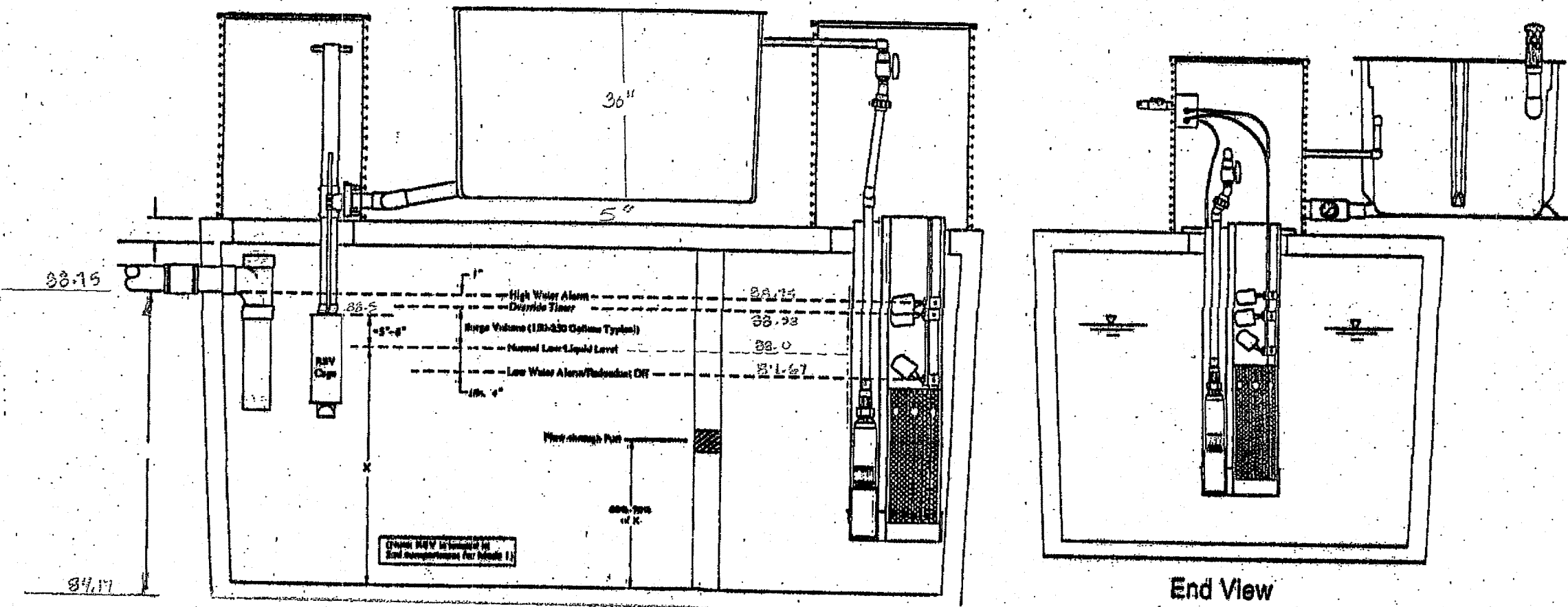


**Bottomless Sand Filter Installed At Grade (Cross Section)**

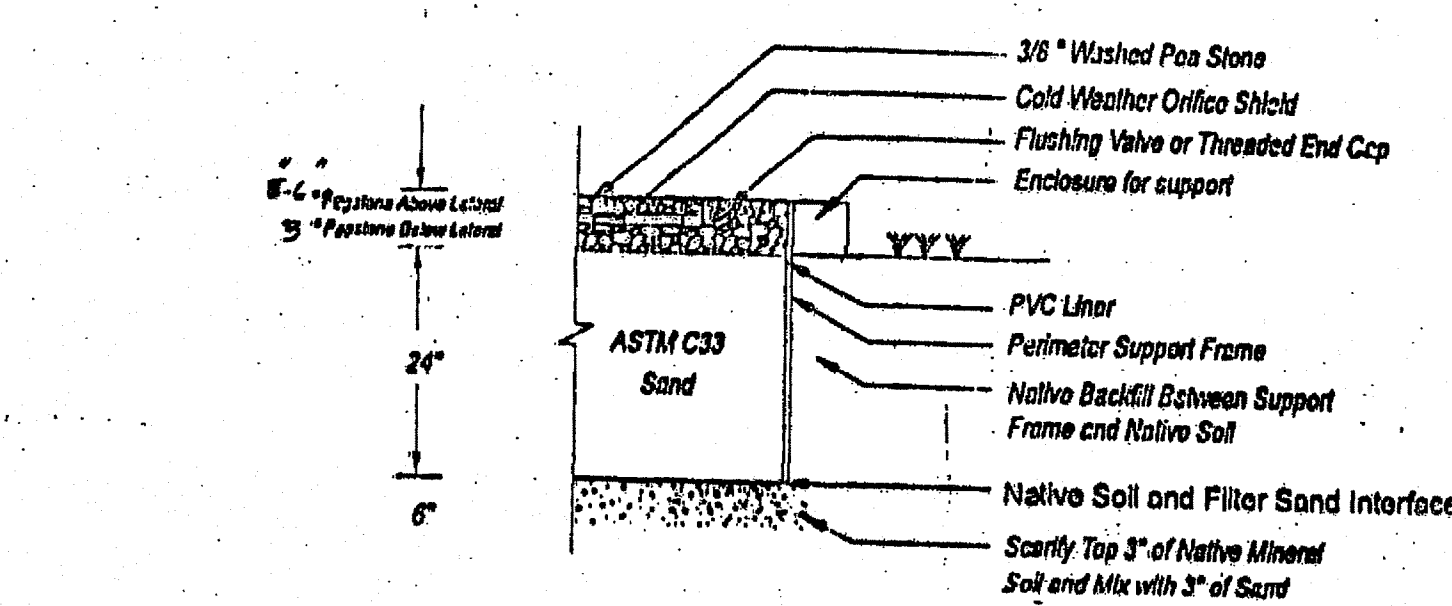
**10x25' Intermittent Sand Filter Bottomless Style**



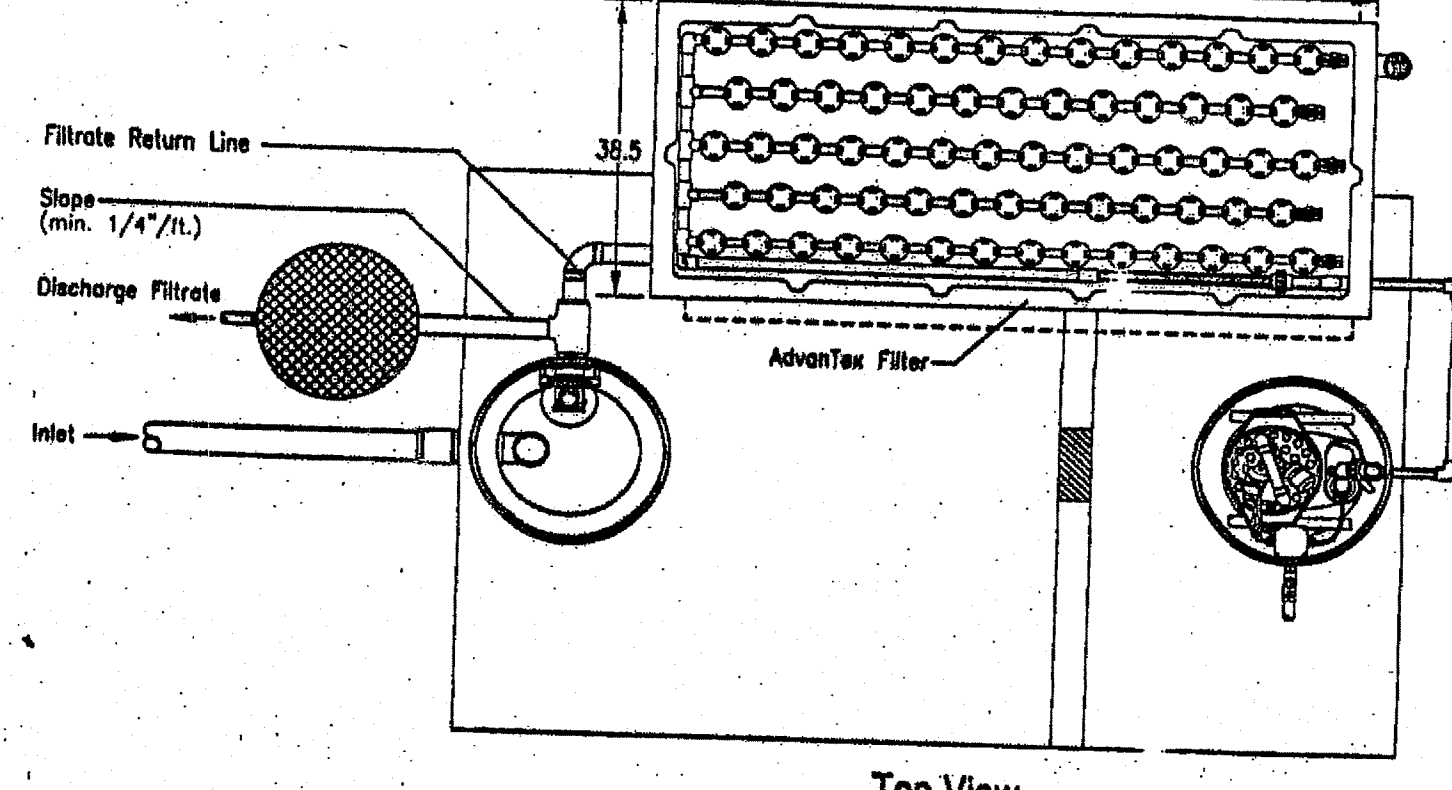
**Typical Liquid Level Positions for Residential AdvanTex™ Treatment System**



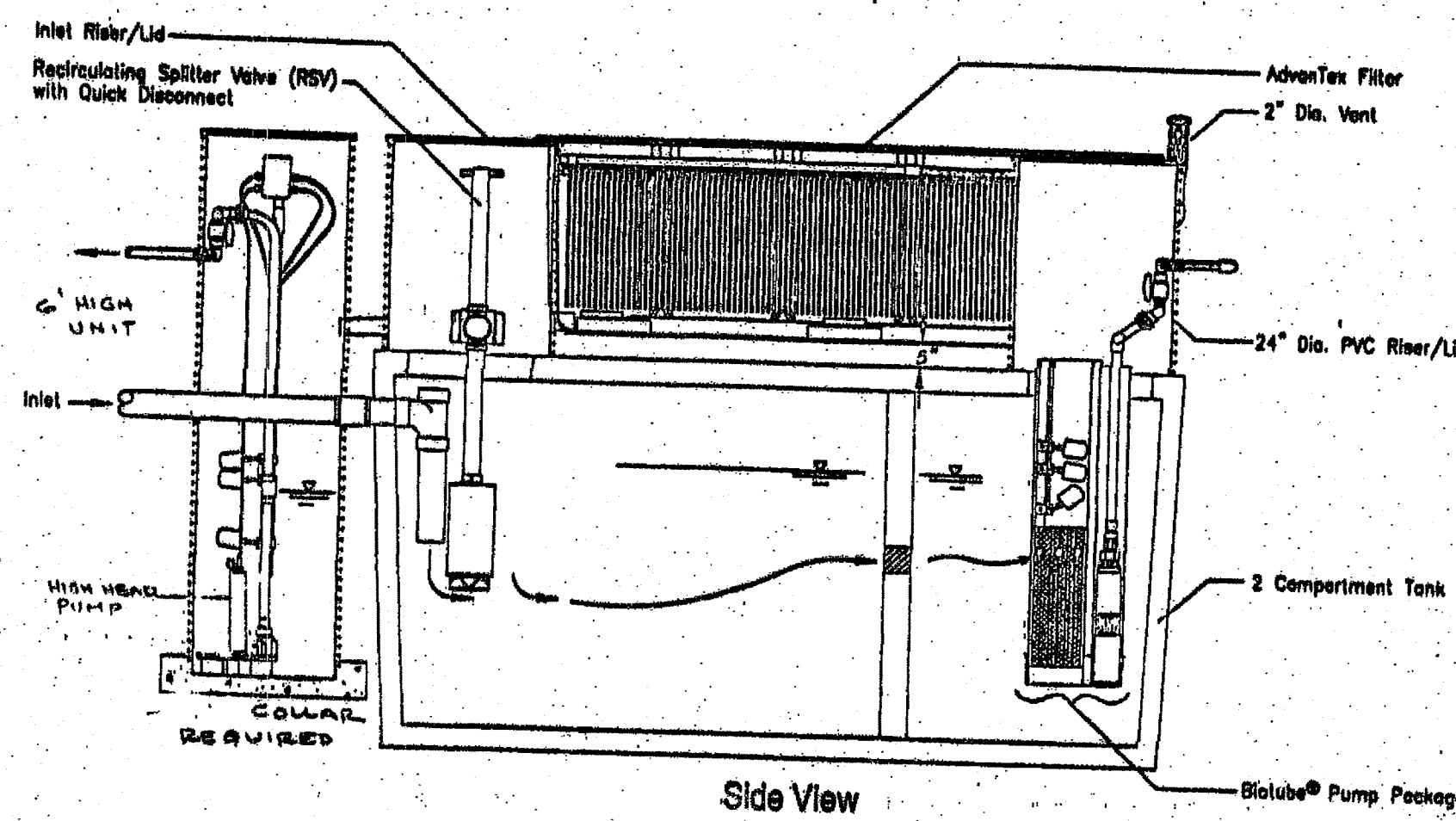
**End View**



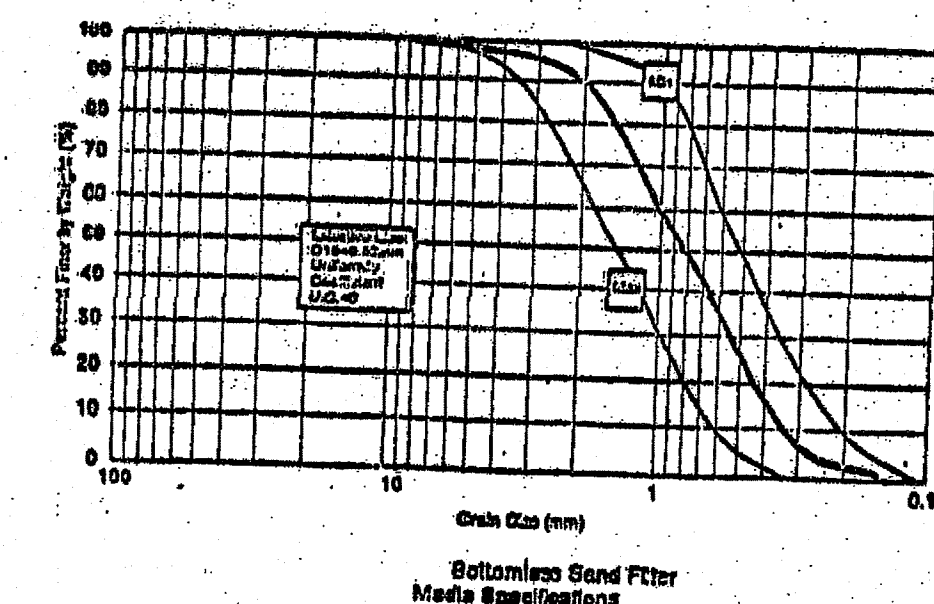
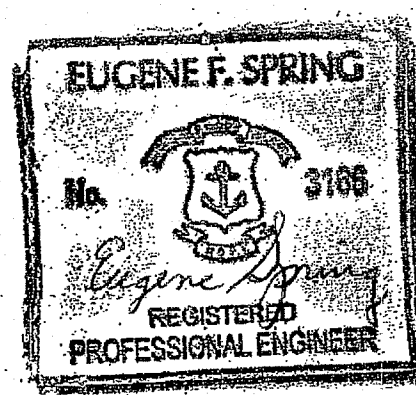
**AdvanTex™ Treatment System AX 20 Series - Mode 3b**



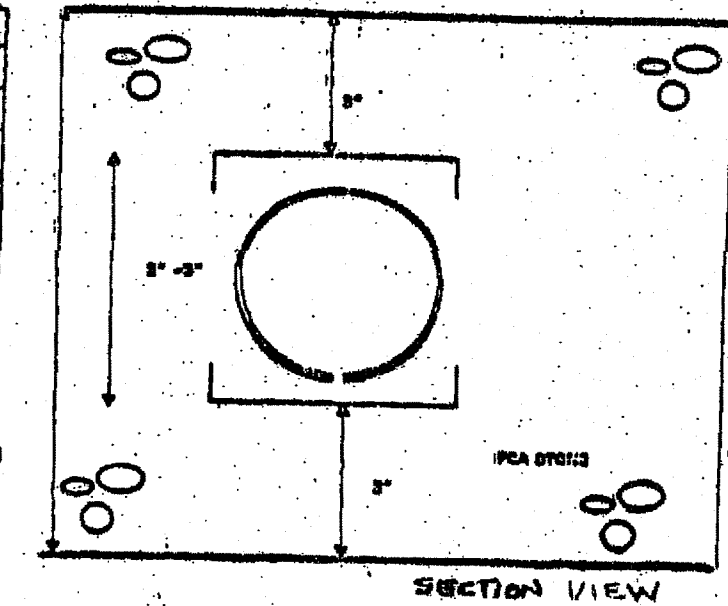
**Top View**



**Side View**

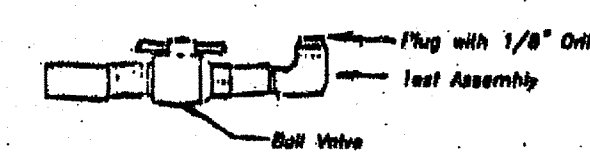


**Bottomless Sand Filter Media Specifications**

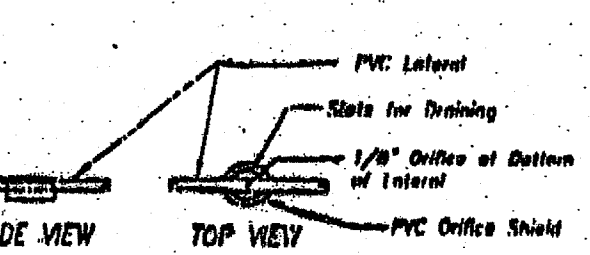
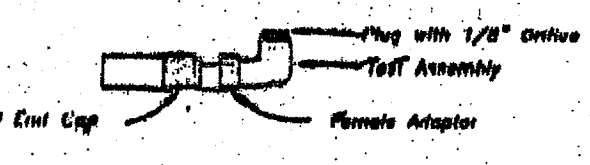


**Section View**

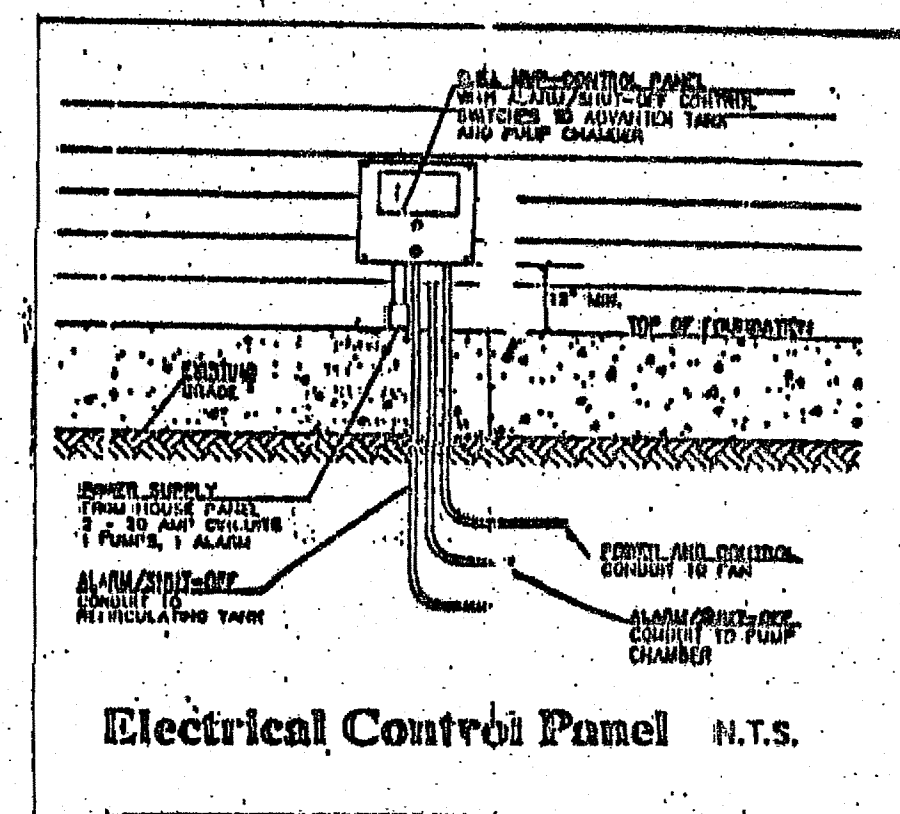
**FLUSHING VALVE DETAIL**



**THREADED END CAP DETAIL**



**COLD WEATHER ORIFICE SHIELD DETAIL (EVERY FIFTH ORIFICE)**



**Electrical Control Panel N.T.S.**

**DETAIL SHEET FOR PROPOSED ISDS FOR**  
 OWNER: JHP LENDING  
 SITE: 901 Moorcroft Rd.  
 AP 17 LOT 46 (FORMALLY A)  
 TOWN: South Kingstown  
 DATE: 6/2/2019  
 SCALE: None sheet 2

Environmental Management  
 JUL 29 2019  
 Office of Water Resources

**ADVANTEX TREATMENT SYSTEM GENERAL NOTES**

1. VENDOR INFORMATION:  
 ATLANTIC SOLUTIONS, C/O MR. BOB JOHNSON  
 2417 EAST MAIN ROAD, PORTSMOUTH, RI 02871, TEL: 401-291-0176
2. THE ADVANTEX AX-20 UNIT MEETS THE RIDEM APPROVAL AS DESCRIBED IN THE APPROVAL CERTIFICATION.
3. THE SEPTIC TANKS AND PUMP CHAMBERS PROVIDED SHALL BE WATER TIGHT TESTED BY THE SUPPLY VENDOR PRIOR TO INSTALLATION.
4. ALL CONNECTIONS SHALL BE WATER TIGHT AND HAVE THE PROPER PIPE SCHEDULE.
5. A LICENSED ELECTRICIAN SHALL INSTALL ALL ELECTRICAL COMPONENTS, INCLUDING, BUT NOT LIMITED TO, CIRCUITS, WIRING, ALARM AND CONTROL PANELS, CONTACTS, ETC. NO POWER SHALL BE TURNED PRIOR TO THE MAINTENANCE VENDOR STARTUP. THE VENDOR, ELECTRICIAN AND DESIGNER SHALL BE PRESENT FOR STARTUP.
6. THE AUTHORIZED ORENCO VENDOR AND SERVICE PROVIDER SHALL INSTALL THE RSV, PUMP FLOATS AND SET ALL TIMERS, COUNTERS, ETC. PRIOR TO STARTUP.
7. THE VENDOR SHALL SUPPLY THE OWNER WITH THE STARTUP INFORMATION, MANUALS, INSTRUCTIONS, MAINTENANCE REQUIRED AND WARRANTIES UPON SATISFACTORY COMPLETION OF THE SYSTEM.
8. THE VENDOR SHALL PERFORM ALL OPERATING AND MAINTENANCE AS REQUIRED BY THE DEM AGREEMENT AND SHALL GIVE PROPER NOTICE TO THE OWNER REGARDING THE COST AND FREQUENCY OF THE WORK.

**BOTTOMLESS SAND FILTER (BSF) OPERATION AND MAINTENANCE REQUIREMENTS**

1. WARNING-BEFORE DOING ANY WORK ON EITHER THE WIRING TO THE LEVEL CONTROL FLOATS AND PUMPS IN THE VAULT, TANKS, OR ON THE CONTROL PANEL, PULL THE FUSE AND OR SWITCH ALL THE CIRCUIT BREAKERS SERVING THE UNIT TO THE OFF POSITION. DO NOT ENTER A CONFINED SPACE WITHOUT USING PROPER EQUIPMENT AND FOLLOWING STANDARD CONFINED SPACE SAFETY PRECAUTIONS.
2. TO REMOVE ACCUMULATED SOLIDS IN LATERALS, FIRST OPEN THE LATERAL END BALL VALVE OR THREADED END CAP. ENGAGE THE PUMP AND FLUSH OUT ANY SOLIDS. A BOTTLE BRUSH ATTACHED TO A PLUMBERS SNAKE IS THEN PUSHED DOWN EACH LATERAL TO UNPLUG THE ORIFICES. WITH THE BOTTLE BRUSH REMOVED, THE PUMP SHOULD AGAIN BE STARTED AND EACH LATERAL FLUSHED OUT. CLEANING MAY BE REQUIRED MORE THAN ONCE A YEAR.
3. THE PEASTONE SURFACE SHALL BE KEPT FREE OF DEBRIS, WEEDS, AND GRASSES. THE SURFACE SHALL BE LIGHTLY RAKED TO REMOVE ANY LEAVES, WEEDS AND GRASSES SHALL BE REMOVED BY HAND WHEN THEY FIRST APPEAR.
4. ONCE A YEAR ALL ELECTRICAL COMPONENTS SHOULD BE CHECKED FOR FUNCTION. ALL FLOAT SWITCHES SHOULD BE ACTIVATED AND TIMERS SHOULD BE CHECKED AGAINST THEIR DESIRED SETTINGS. ALL FLOAT SWITCHES SHOULD BE HOSED DOWN TO PREVENT SCUM ACCUMULATION. ALL WIRING SHALL BE NEATLY BUNDLED AND PLACED OUT OF THE OPERATING PATH OF THE FLOAT SWITCHES.
5. ALL WORK SHALL BE PERFORMED BY THE AUTHORIZED ORENCO VENDOR AND THE OWNER SHALL BE PROVIDED WITH COST AND FREQUENCY OF MAINTENANCE.