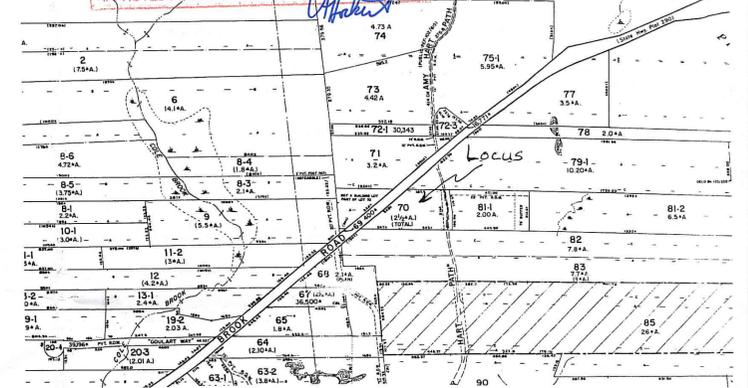
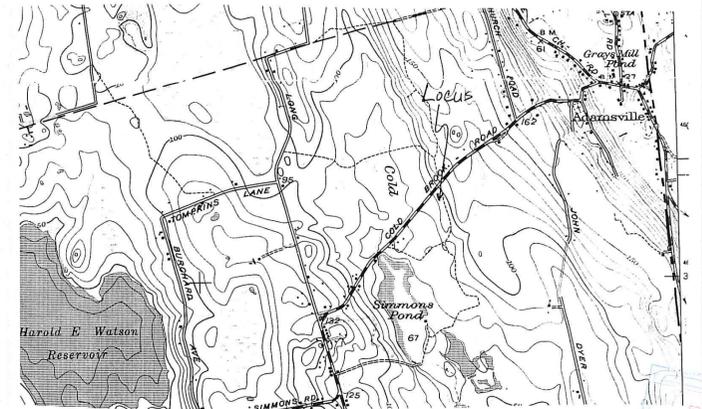


DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED OCT 29 2008 FILE # 08-0201  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVAL PLANS MUST BE AT COMPTON SITE



LOCUS MAP  
SCALE: 1" = 2083'±

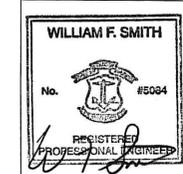


ASSESSOR'S MAP  
NOT TO SCALE

Permanent Markers  
Required along  
Limits of Disturbance  
per RI DEM, see  
condition No.11

Limits of Disturbance  
and Erosion Controls  
Revised per RI DEM

- LEGEND
- ..... 98..... EXISTING CONTOUR
  - PROPOSED CONTOUR
  - ~~~~~ EDGE OF VEGETATION
  - ▲ WETLAND EDGE
  - - - - - 50' PERIMETER WETLAND
  - - - - - 100' TOWN OF LITTLE COMPTON BUILDING & ISDS SETBACK
  - RHODE ISLAND HIGHWAY BOUND
  - MONUMENT FOUND
  - ◆ GROUNDWATER TABLE TEST
  - UTILITY POLE

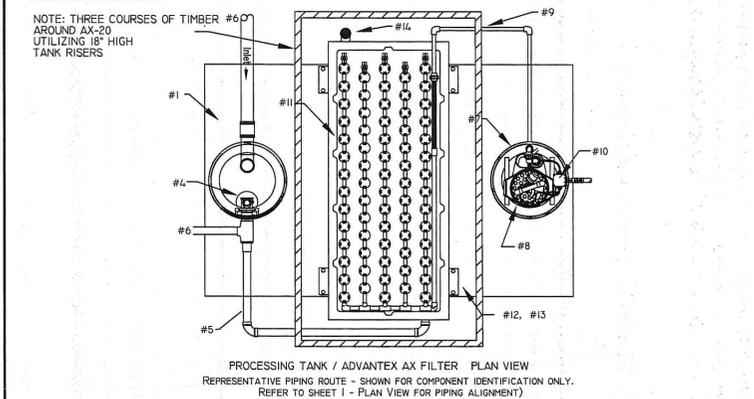
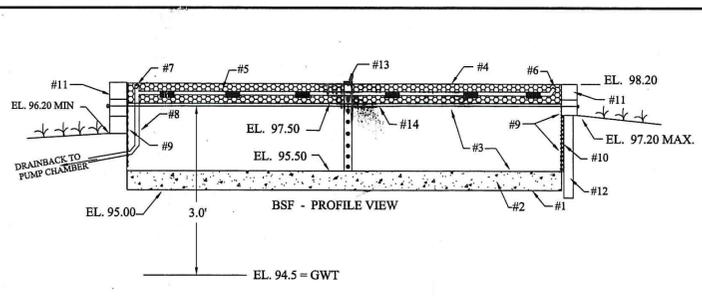
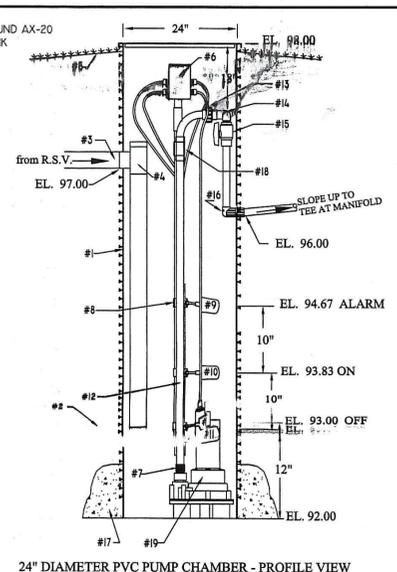
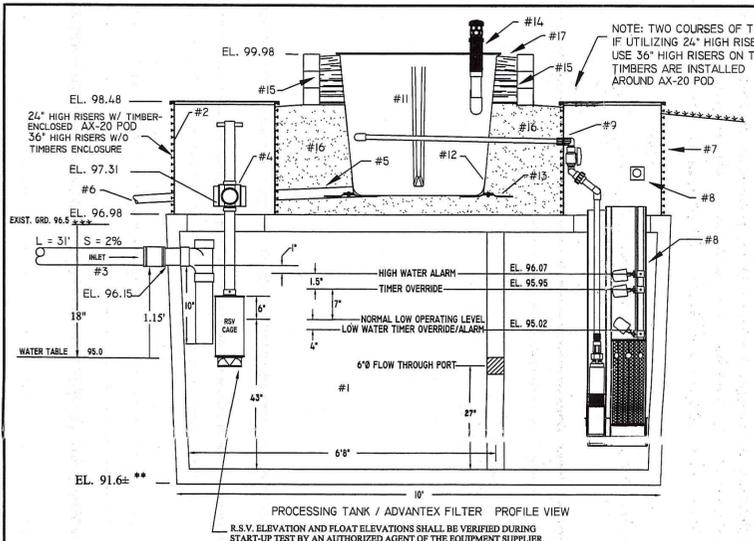


REVISIONS:

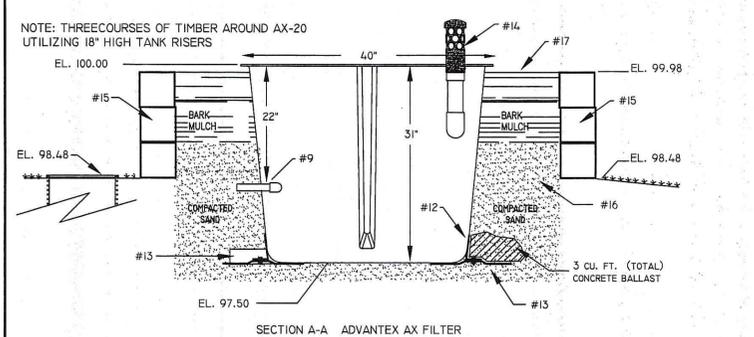
PROPOSED OWTS NEW CONSTRUCTION  
PREPARED FOR  
**SHEILA QUINTIN**  
ASSESSOR'S PLAT 40 LOT 70-2 (FORMERLY 69 & 70)  
COLEBROOK ROAD  
LITTLE COMPTON, RHODE ISLAND  
SCALE: 1" = 30' DATE: JUNE 3, 2008  
**Civil Engineering Concepts, Inc.**  
34A MAIN STREET P.O. BOX 5323  
LITTLE COMPTON, RI 02837 NEW BEDFORD, MA 02742  
PH: (401) 592-0177 FAX: (401) 592-0178 (508) 990-4900

SHEET 1 OF 2

JOB#: 08-015



1. PVC water tight basin w/ fiberglass cover
2. Backfill material to be compacted (1' lifts) granular (sandy) fill
3. 2" SCH-40 PVC (gravity) from R.S.V. Pressure rated fittings required, DWV fittings not permitted
4. 2" x 2" x 2" SCH-40 tee with drop pipe extending to lowest float
5. Finished grade to be 1" min. below cover
6. Waterproof / vapor-proof PVC junction/splice box & elec. conduit
7. SCH-40 reducer required: 1.5" to 1.25"
8. Level Control Float Assembly - removable w/o entry into chamber
9. "ALARM" Float
10. "ON" Float
11. "OFF" Float
12. Discharge Transport piping: Class 200 psi (SCH-40) with pressure rated fittings - DWV fittings not permitted
13. Threaded Disconnect - accessible from surface w/o chamber entry
14. Drainback-type assembly required
15. Fully ported Shut-off
16. 3/16th inch Weepholes (directed away from floats)
17. CONCRETE BALLAST REQUIRED - 12 CU. FT. (min)
18. Checkvalve not required. Anti-siphon valve not required.
19. OSI Effluent Pump: O.S.I. #PEF3



- 99.35.....Top of Foundation  
 98.35 .....Slab on grade  
 96.77 .....Invert at foundation wall
- 96.5 .....Average exist. grade at Tank  
 95.0 .....Elevation of Water Table at Tank (18" below exist. grd.)  
 96.15.....Inlet invert at Tank
- 97.00.....Inlet invert at BSF Pump Chamber  
 96.00.....Invert out of BSF Pump Chamber
- 97.20.....Max. prop. grade adjacent to BSF  
 98.20.....Elevation of top of Pea Stone  
 97.75.....Invert of Distribution Lateral (laid level)  
 97.50.....Top of C-33 Filter Sand  
 95.50.....Bottom of C-33 Filter Sand  
 95.00.....Bottom of 6" layer C-33 / Native Soil  
 94.5 .....Elev. of Water Table at BSF (18" below exist. grd.)  
 96.0 .....Existing average grade at BSF

1. 1500 gallon H-10 rated Processing Tank with baffle
2. 18" high, 24" dia. PVC inlet riser / fiberglass cover, watertight tank adapter
3. 4" SCH-40 PVC bldg. sewer inlet pipe w/ tee
4. Recirc. Splitter Valve (manufacturer specified)
5. 2" SCH-40 (gravity) pipe from AX-20 pod to R.S.V.
6. 2" SCH-40 (gravity) pipe from R.S.V. to B.S.F. pump chamber
7. 18" high, 24" dia. PVC riser / fiberglass cover, watertight tank adapter
8. Biotube Recirc. Pump Package w/ OSI P3005, 1/2hp., 1" discharge
9. 1" Class 200 (SCH-40) PVC from Biotube AX pump to AX pod. Pressure rated fittings required - DWV fittings not permitted
10. Waterproof / Vapor-proof junction/splice box & elec. Conduit
11. Advantex AX-20 Recirc. Media Filter pod
12. Factory installed bracket (1 of 4)
13. Contractor installed, factory provided Anti-Floatation Flange (1 of 2) with stainless steel thru-bolts and 3 cu. ft. on concrete ballast
14. OSI Passive Air Vent (ventilation assembly to extend 12" min. above finished grade)
15. Three courses of 6" x 6" P.T. Timber wall (same const. method as BSF enclosure) required using 18" high tank risers. No timbers required with 36" high risers.
16. Compacted, well draining, granular (sandy) material. 5" minimum under pod.
17. Clean bark mulch spread from top of sand up to 1" below top of AX pod.



**ELEVATION SCHEDULE**

NUMBER OF BEDROOMS: 2  
 DESIGN GALLONAGE: 230 gal/day  
 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 TYPE: FIRM SIL  
 SOIL CATEGORY: Soil Category 9  
 BSF LOADING RATE: 1.5 gal/d/day, timed dose category 1 L.R.

TOTAL SQUARE FOOTAGE REQ'D:  
 230 GAL/DAY  
 1.5 L.R. = 153.4 S.F. REQUIRED

BSF SQUARE FOOTAGE PROVIDED:  
 7.5' x 22.5' = 168.7 S.F. PROVIDED

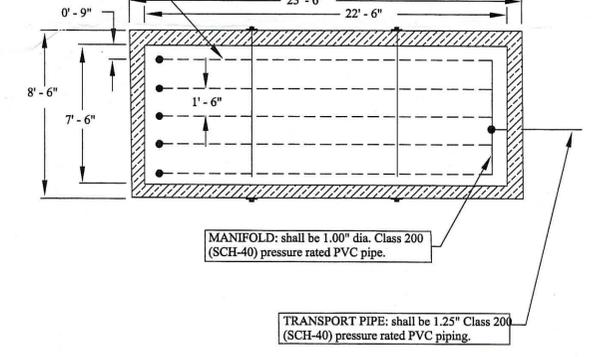
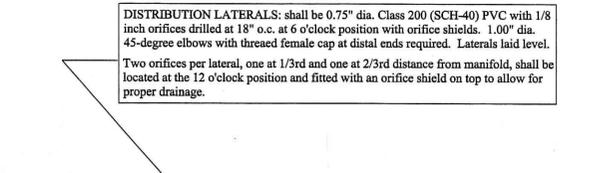
BSF PUMP CHAMBER SIZE: 24" diameter, 6" deep  
 BSF DOSING CYCLE: 10' drawdown between "OFF" and "ON"  
 DOSING QUANTITY: 19.6 GALLONS/CYCLE

BSF DISCHARGE:  
 19.6 gal/cycle - 0.6 gal (drainback)  
 75 orifices (per zone) = 0.25 GAL/ORIFICE/CYCLE

37.6 gpm (pump discharge)  
 75 orifices = 0.50 GPM/ORIFICE

EMERGENCY STORAGE BELOW HIGH WATER ALARM: 19.6 GALLONS

1. Scarified and non-compacted native soil. Existing BSF ground surface preparation shall only consist of stripping native "A" and native "B" Horizons (if necessary) down to the specified elevation.
2. 6" thick layer of evenly mixed Native Mineral Soil (from B Horizon) and ASTM C-33 Sand
3. 24" minimum thick layer of non-compacted ASTM C-33 Sand
4. 8" (min) thick layer of 3/8" High Washed Pea Gravel
5. Class 200 (SCH-40) PVC riser with pressure rated fittings and orifices (with shields) PVC pipe as specified in detail below.
6. 45-degree elbow with threaded female cap (matching lateral diameter)
7. Class 200 (SCH-40) PVC Manifold pipe with threaded male plug clean out
8. Class 200 Transport pipe from BSF pump chamber. Insulation sleeved over vertical portion of transport pipe inside BSF. Install "Tee" and 2" threaded plug at 90-degree bend / connection to Manifold (allowing cleaning access to Transport pipe).
9. 30 mil. PVC liner
10. 1/2" non-PT plywood support frame below grade
11. 6" x 6" PT timber support frame above ground
12. 4" x 4" vertical non-PT vertical support timbers to brace 6" x 6" timber frame construction and plywood frame. Recommend 3 vertical timbers at each corner and every 10' o.c.
13. 4" dia. filter fabric wrapped SDR-35 inspection well with removable cap
14. 1/2 inch (min) dia. threaded tie rods required when 6" x 6" timbers exceed 2 courses min in height. Refer to Bottomless Sand Filter note #28.
15. 4" x 4" vertical non-PT vertical support timbers to brace 6" x 6" timber frame construction and plywood frame. Recommend 3 vertical timbers at each corner



**BOTTOMLESS SAND FILTER DETAILS**  
 NOT TO SCALE

PROCESSING TANK  
 Tank type: 1500 Gallon H-10 Tank Wt.: 12,400 lbs.  
 Weight of Earth Cover (min. of 1.25' of soil on tank): 5,683 lbs.  
 Upward lift (neglecting soil friction):  
 10.5' (length) x 5.66' (width) x 3.6' (max. submerged depth) x 62.4 lbs/c.f. = 13,350 lbs.

Safety factor:  
 12,400 + 5,683  
 13,350 = 1.35

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):  
 Assume maximum water table at 1.5' below rim  
 1.0' x 1.0' x 3.14 x 4.5' x 62.4 lbs/c.f. = 882 lbs.

Concrete ballast required: 12 cu. ft. min.  
 12 cu. ft. x 87.6 lbs/c.f. (submerged conc. wt.) = 1051 lbs.

Safety factor:  
 200 + 1051  
 882 = 1.4

- GENERAL CONSTRUCTION NOTES:**
1. Designer recommends installing the septic system during dry months (June-October) to avoid complications with a high water table or excessive surface water runoff during construction. A high water table or saturated ground conditions during construction activities could compromise the quality and life expectancy of the system.
  - 1a. All construction shall conform to the State of Rhode Island and Providence Plantations Department of Environmental Management - Rules and Regulations Establishing Minimum Standards relating to location, design, construction, and maintenance of On-Site Wastewater Treatment Systems as most recently amended, and in accordance with the Bottomless Sand Filter Guidelines Document (as most recently amended).
  2. All work shall be done in a workmanlike manner with lines laid as straight as possible and joints made watertight. All work shall be performed by an Installer licensed in the State of Rhode Island and certified for the installation of B.S.F. - type systems by RI DEM and the Vendor. Verification of Installer's certification may be required by the Designer prior to "start of construction" request by the Installer.
  3. 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.
  4. Contractor or homeowner shall provide the designer with a copy of the recorded Maintenance Agreement prior to the Designer's issuance of Certificate of Construction.
  5. 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. Actual locations are to be verified by the Contractor prior to excavation through Dig-Safe procedures and any local utility department as necessary.
  6. Area to be utilized for the B.S.F. shall remain clear of all vehicles, equipment, and stockpiles materials. Contractor shall delineate the B.S.F. area with caution tape to restrict access. Compaction or smearing of native soil will compromise the operation of the B.S.F.
  7. 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. The use of incorrectly sized hole saw will result in improperly seated grommets. Any conduit/piping installed into polyethylene riser or tank that is not watertight will not be approved by the Designer.

- SEPTIC/RECIRCULATION TANK:** Gallonage as specified on Processing Tank Detail
1. 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 foam placement (level) 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.
  2. 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. Stale water tested required on the tank following attachment of risers. The life span of the system would be compromised by the intrusion of any groundwater.
  3. Manufacturer's mounting hardware shall be utilized. All materials and construction shall meet the manufacturer's 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.
  4. For additional information see details contained within this plan, accompanying documentation and manufacturer's 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 all accessories such as alarms, floats, etc. that are compatible with the pumps. O.C. components requiring extensive modification to the system are not permitted.
  5. 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.
  6. 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 AX RECIRCULATING MEDIA FILTER:**
7. 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.
  8. 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 prevent settlement and air pockets that may fill with water resulting in floatation.
  9. Hand compaction of backfilled material under the AX pod and related piping is required to prevent settlement and air pockets that may fill with water resulting in floatation.
  10. All piping connected to the AX unit shall be Class 200 (SCH-40 or SDR-21) pressure rated piping with pressure rated fitting (no DWV-type fitting permitted).
  11. 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 drainage. Bottom of the perforated air intake shall be 12" minimum above finished grade.
  12. 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.
  13. Mulch or pea stone covered with mulch shall be placed between the pod and the timbers, extending to the top of the timbers.
  14. Finished grade shall slope down and away from the cover to prevent surface water from ponding on and entering the cover.
- B.S.F. PUMP SYSTEM:**
15. OSI 6" deep 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 B.S.F. is located below the pump chamber "OFF" float elevation. Final foam placement (elevation) shall be at least 1' below the fiberglass PVC access cover and graded away from chamber to prevent surface water from ponding on and entering the cover.
  16. Transport line shall be Class 200 (SCH-40) pressure piping (with pressure rated fittings) laid at consistent slope up to the B.S.F. Manifold to allow for drainback. A minimum of 15" earth cover over pipe is required unless insulation is specified. Transport pipe shall be threaded onto pump basin's flexible discharge pipe. 1 cu. ft. (min) concrete thrust blocks required at all angle points.
  17. B.S.F. pump(s) shall be as specified. Any pump substitution shall require the Designer's review of the substitute pump specifications and pump curve
  18. B.S.F. 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 B.S.F. filter box.

- ELECTRICAL CONTROL/ALARM PANEL:** w/ telephone line remote telemetry connection
19. Control Panel shall be an OSI pump-matched NEMA-4 rated waterproof lockable unit with visual alarms and programmable timer that operates both OSI AX Media Filter pump unit and B.S.F. pump on same circuit.
  20. Panel to be mounted adjacent to exterior wall of the building 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.
  21. 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 B.S.F. pumping system, and the pressure (head) testing of the B.S.F. laterals. Any subsequent electrical work shall include the Electrician's verification that the electricity is properly restored to the panel.

- BOTTOMLESS SAND FILTER (B.S.F.):**
22. B.S.F. shall be constructed as shown with materials as specified in the details. Installation of a 4" dia. perforated (filter fabric wrapped) inspection well required.
  23. Sand media material shall conform to ASTM C33 sand (sieve) requirements with less than 1% fines passing number 200 sieve. Bank run sand or conventional ISDS sand/gravel is not permitted. Designer may require sieve analysis from supplier within 3 days prior to sand delivery.
  24. Manifold: dia. as specified on detail and shall be Class 200 (SCH-40) PVC. All fittings shall be pressure rated (DWV fittings not recommended).
  25. Distribution lateral: dia. specified on detail and shall be Class 200 (SCH-40) PVC with 1/8" orifice holes (drilled with a new bit) and fitted slotted cold weather orifice shields spaced at intervals specified. Lateral 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).
  26. Leaching area excavation shall be level and scarified as shown on B.S.F. cross-section detail. Care shall be taken to avoid compaction of remaining soil. Excavation of native material below the B.S.F. shall only be to the extent designated on the plan. Where the B.S.F. is located completely above ground, material removal shall only consist of stripping grass/hatch layer and a horizon. Prepared native soil surface (bottom inspection) shall be inspected by the Designer prior to placement of 6" thick layer of sand/soil mix.
  27. Above ground B.S.F. support framing shall consist of 6" x 6" pressure treated timbers drilled and pinned to the soil with #5 or #4 rebar and screwed/nailed together at the corners and joints. Below ground construction shall utilize 1/2" min. thickness P.T. plywood in place of timbers. 30 ml. 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).
  28. Where more than two courses of 6" x 6" timbers are exposed, 1/2" dia. threaded galvanized rod(s) 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 B.S.F. (approximately 12" o.c.).
  29. Trees or shrubs shall not be planted within 10' of the B.S.F. without vertical placement of a suitable root barrier fabric installed at least 3' beyond the B.S.F. and extending from 4" below finished grade to 1' below the bottom of the native soil/B.S.F. sand interface.
  30. Heavy equipment shall not be operated over the components or the prepared leaching area during installation. Rubber tired machinery is not to be driven over the prepared natural soil base or sand/stone bed during system installation.
  31. B.S.F. 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.
  32. All existing or proposed (if any) wells within 200' of proposed OWTS are shown. Site is to be serviced by a private well.
  33. All existing or proposed (if any) public wells within 500' of proposed OWTS are shown.
  34. All existing or proposed septic systems within 100' of any proposed or existing on-site well are shown.
  35. No parking is permitted in the vicinity of the OWTS.
  36. 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 Minimum Setback Distances.
  37. A backup generator (adequate for supplying the pumps in case of electrical failure) is strongly recommended.
  38. Property lines as depicted on this plan are approximate only based on Assessor Tax Maps and are not the result of a boundary survey.
  39. For proper operation, the septic tank shall be inspected annually and pumped when any solids accumulation exceeds 1/3rd liquid depth.

40. 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.

41. TWO-BEDROOM DEED RESTRICTION is required to be filed in the applicable Town Hall Evidence records office.

42. Any silt fencing or haybale checkdams shown on the plan are to be installed prior to any site activity and shall remain in place and be maintained until all activities are completed, inspections performed, and vegetation established.

43. Any substantial silt accumulation against the haybales or silt fencing is to be removed in a manner that will not compromise the effectiveness of the erosion control device.

44. All construction litter and debris is to be removed from the vicinity of the haybales or silt fencing on a daily basis.

**FRESHWATER WELL**  
 APPROVED WITH CONDITIONS  
 AS SPECIFIED IN THE LETTER OF APPROVAL  
 DATED OCT 29 2008 FILE # 08-0201  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT THE PROJECT SITE

PREPARED FOR  
**SHEILA QUINTIN**  
 ASSESSOR'S PLAT 40 LOT 70-2 (FORMERLY 69 & 70)  
 COLEBROOK ROAD  
 LITTLE COMPTON, RHODE ISLAND

SCALE: NONE DATE: JUNE 3, 2008

**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  
 (508) 990-4900

REVISIONS:  
 SHEET 2 of 2  
 JOB# - 08-015