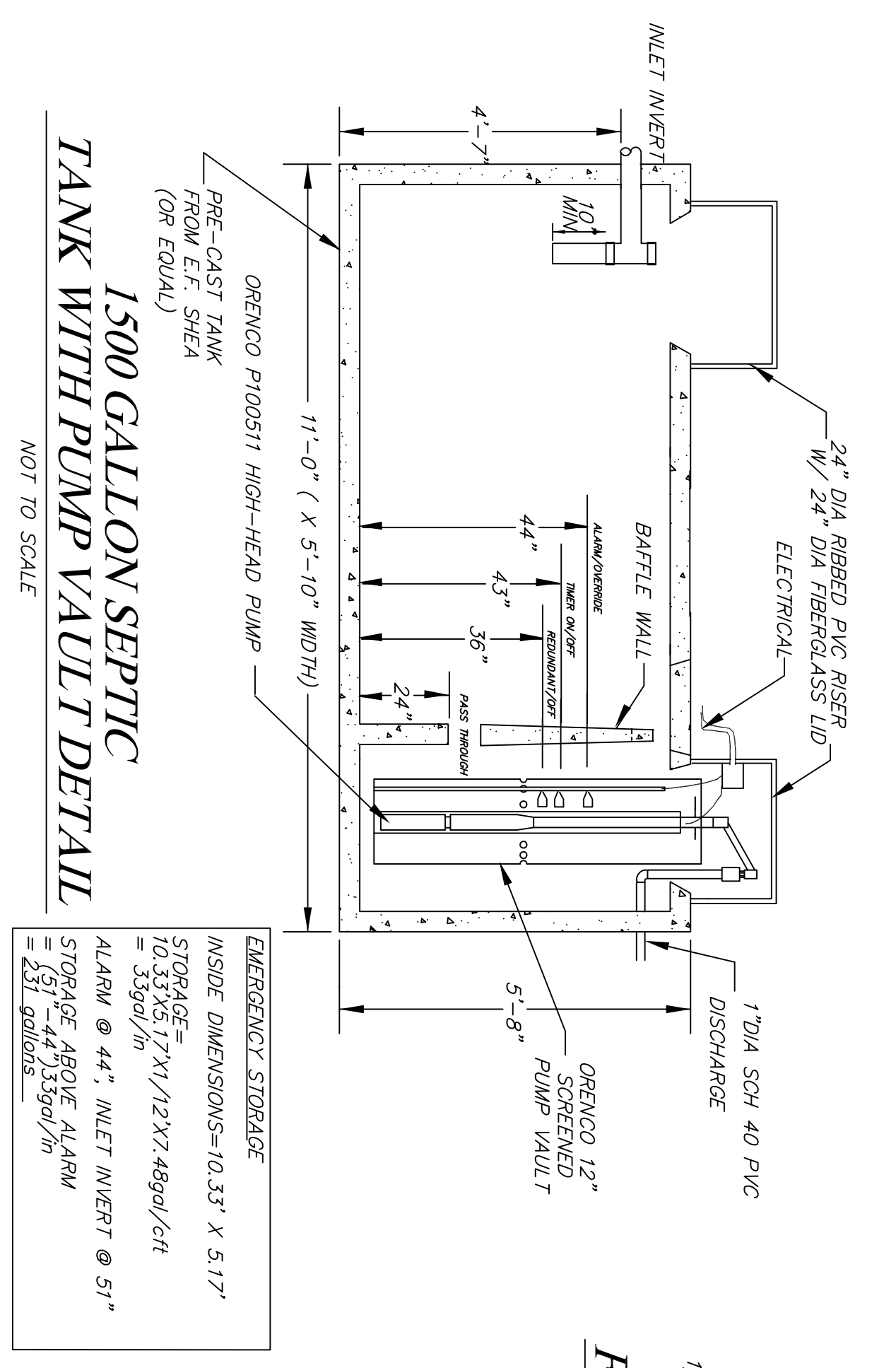


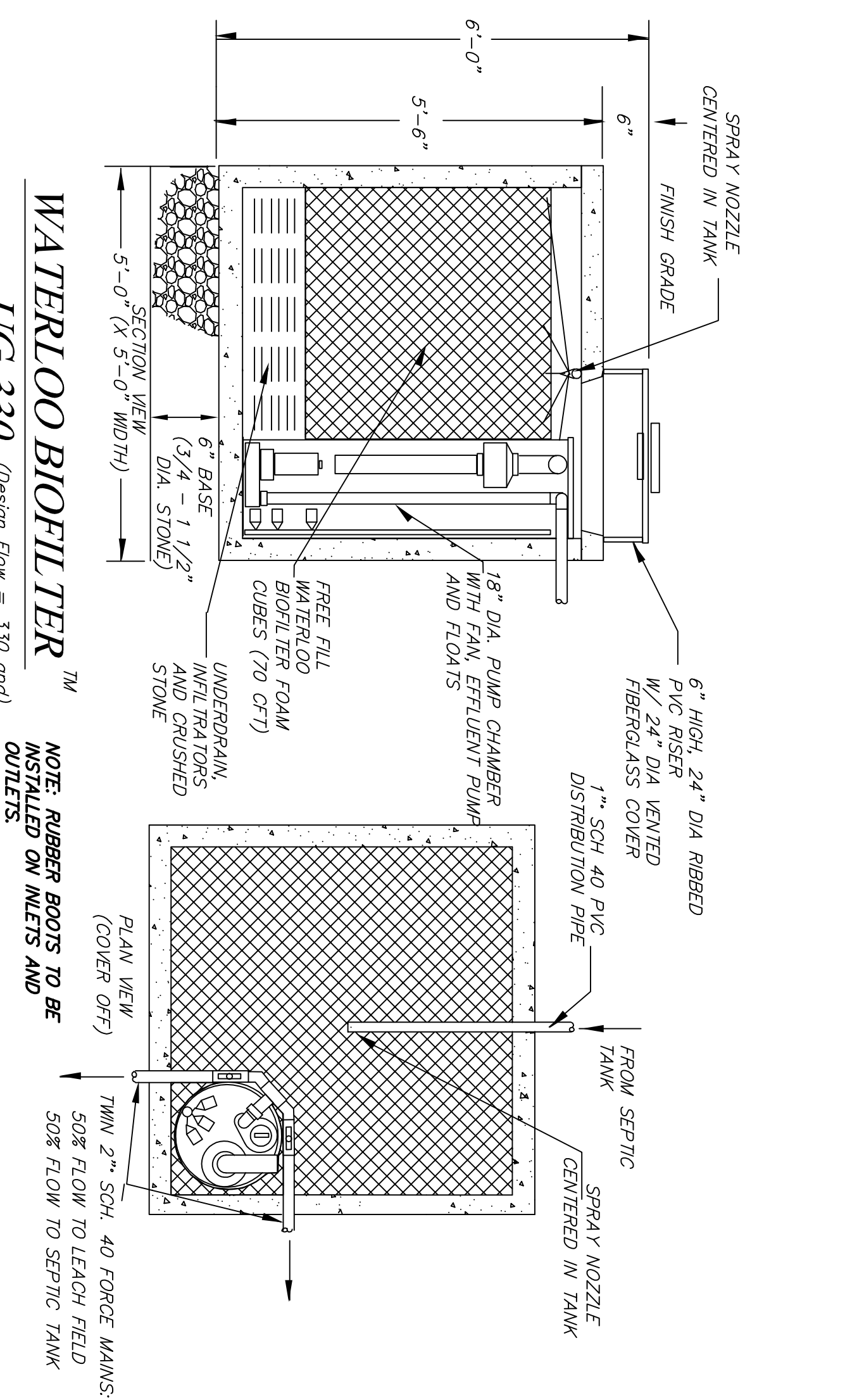
- 1) FIRST COMPARTMENT: 440 GALLONS
 2) SECOND COMPARTMENT: N/R
 PROSTEP 2-BEDROOM (2200GD)
 1500 GALLON SEPTIC TANK WITH PUMP VAULT
- ### SEPTIC TANK REQUIREMENTS



NOTE: RUBBER BOOTS TO BE INSTALLED ON INLETS AND OUTLETS
 ALARM SHALL BE ON SEPARATE CIRCUIT FROM PUMPS

BUOYANCY CALCULATIONS:

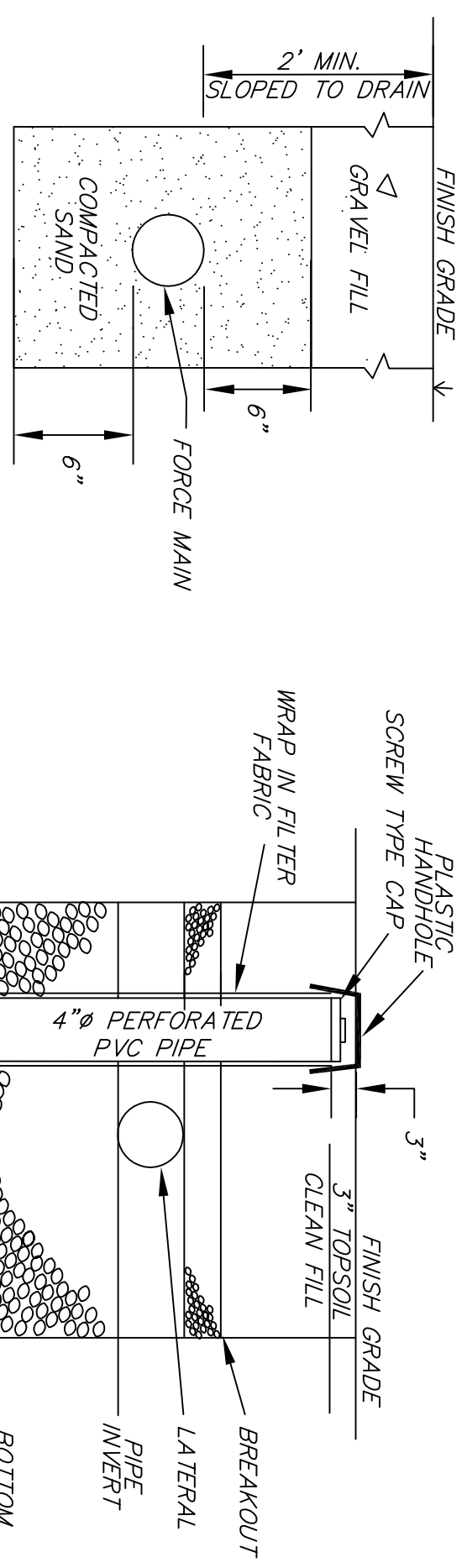
1500 GALLON 2-COMPARTMENT SEPTIC TANK/PUMP VAULT:		WATERLOO BIOTILER MONOLITHIC H-10 UG330 gpd CHAMBER:	
TANK WEIGHT:	11,641 LBS	SOIL WEIGHT:	6,000 LBS
TOTAL DOWNWARD WEIGHT:	26,446 LBS	TOTAL DOWNWARD WEIGHT:	7,900 LBS
TOTAL UPLIFT FORCE (DISPLACED WATER):	520 LBS	TOTAL UPLIFT FORCE (DISPLACED WATER):	0 LBS
FACTOR OF SAFETY:	>10	FACTOR OF SAFETY:	>10



WATERLOO BIOTILER

UG-330 (Design Flow = 330 gpd)
 NOT TO SCALE

NOTE: RUBBER BOOTS TO BE INSTALLED ON INLETS AND OUTLETS.
 ALARM SHALL BE ON SEPARATE CIRCUIT FROM PUMPS

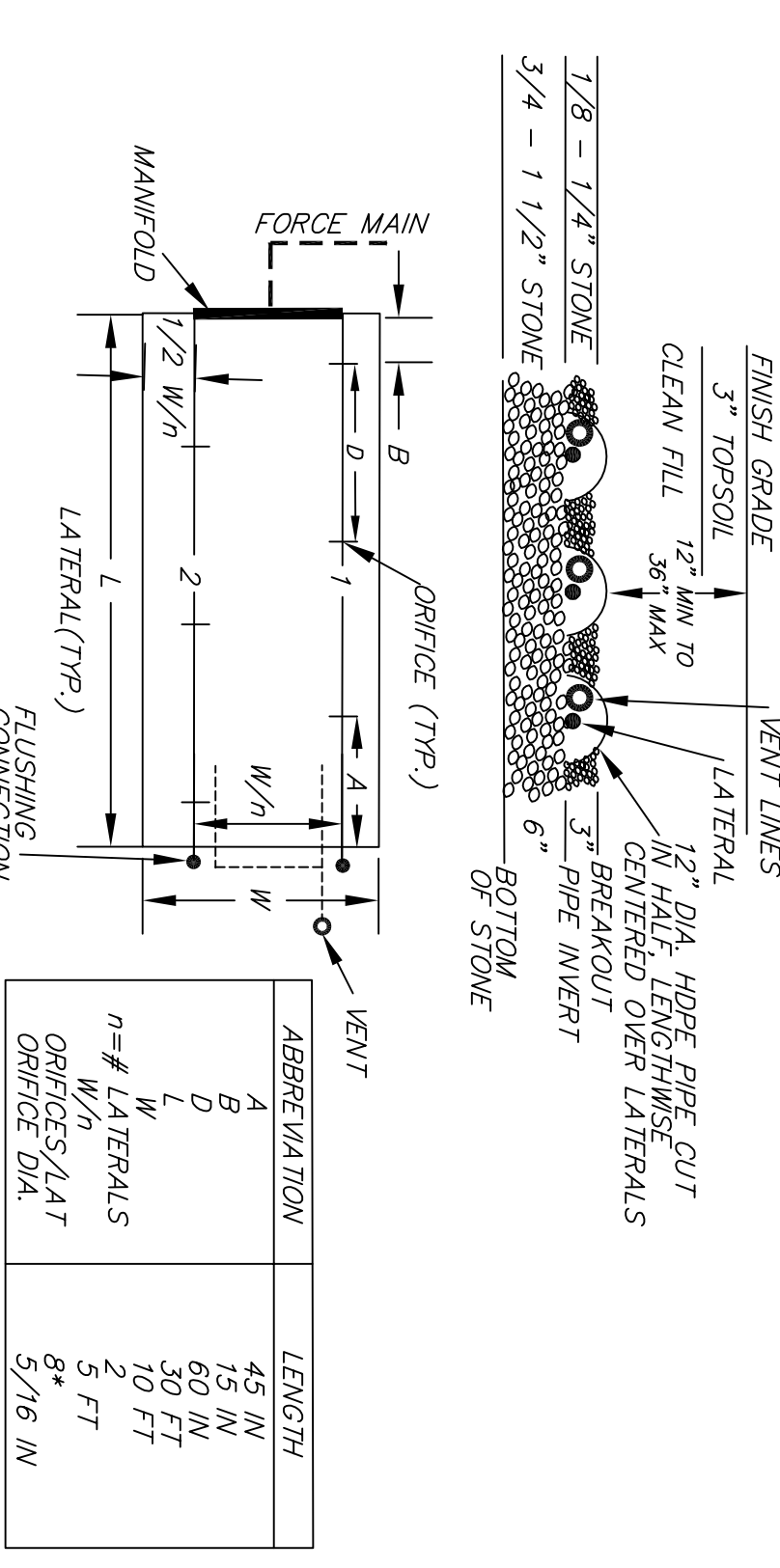


FORCE MAIN TRENCH

310 GMR 15221(6)
 (NOT TO SCALE)

INSPECTION PORT

310 GMR 15240(3)
 (NOT TO SCALE)



*INCLUDES 2-ORIFICES DRILLED THROUGH PIPE INVERT (SEE NOTE #4 BELOW)

1) BOTTOM OF FIELD SHALL BE LEVEL AND SCARIFIED PRIOR TO PLACING STONE.
 2) STONE SHALL BE DOUBLE WASHED.
 3) HAND-HOLDS SHALL BE PLACED OVER FLUSHING CONNECTIONS WITH COVERS.
 AT FINISH GRADE.
 4) (a) ORIFICES IN EACH LATERAL SHALL BE DRILLED IN THE CROWN OF THE PIPE.
 (b) THE 2ND AND 4TH ORIFICE SHALL BE DRILLED THROUGH THE INVERT TO ALLOW FOR PIPE DRAINAGE.

PRESSURE DOSED LEACH FIELD DETAIL:

DISCHARGE ELEV. PUMP OFF ELEV. TOTAL STATIC HEAD

51.60 feet / 48.9 feet / 2.7 feet

FRICITION LOSSES IN PUMP CHAMBER

QTY	DIAM	LOSS/FT	LENGTH	LOSS	FRICITION LOSS
1	2	5.0	2.0	10.0	10.0 FT
1	2	2.5	2.0	5.0	5.0 FT
1	2	14.0	1.0	14.0	14.0 FT
1	2	1.2	2.0	2.4	2.4 FT
TOTAL LOSS					31.4 FT

FRICITION LOSSES IN PIPE RUN:

QTY	DIAM	LOSS/FT	LENGTH	LOSS	FRICITION LOSS
2	3	3.0	2.0	6.0	6.0 FT
2	2	2.5	2.0	5.0	5.0 FT
2	2	2.0	2.0	4.0	4.0 FT
1	2	12.0	1.0	12.0	12.0 FT
TOTAL LOSS					27.0 FT

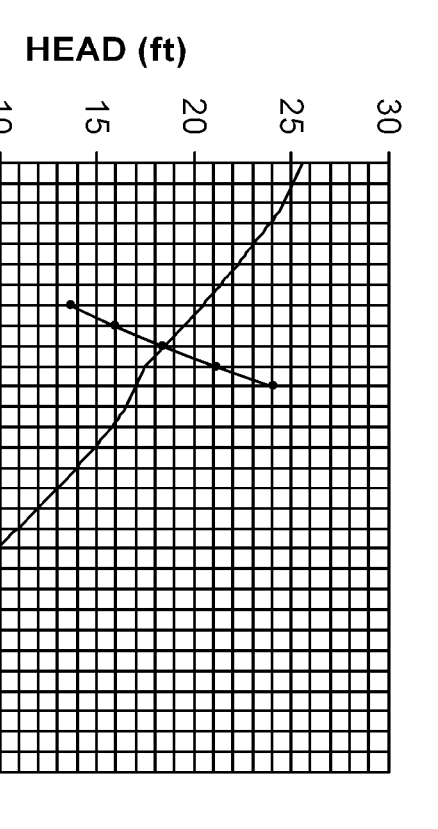
FRICITION LOSSES IN FITTINGS:

QTY	DIAM	LOSS/FT	LENGTH	LOSS	FRICITION LOSS
2	3	5.0	2.0	10.0	10.0 FT
2	2	2.5	2.0	5.0	5.0 FT
2	2	2.0	2.0	4.0	4.0 FT
1	2	12.0	1.0	12.0	12.0 FT
TOTAL LOSS					21.0 FT

COMPOSITE SYSTEM CURVE

Flow (gpm)	Static Head (feet)	Residual Press. at Disal End (feet)	TDD
35	2.7	3.0	13.6
40	2.7	3.0	15.8
45	2.7	3.0	18.3
50	2.7	3.0	21.1
55	2.7	3.0	24.0

Plot Flow and TDD on Pump Curve to determine operating point of pump.



GENERAL

Discharge Frequency: 1
 Min. Volume per Dose: 5
 No. of Leaches: 2

FORCE MAIN

Manifold Length: 15
 Total Equivalent Length: 62
 Nominal Inside Diameter: 2

MANIFOLD

No. of Segments: 2
 Length of Manifold Segment Equivalent Length: 3
 Nominal Inside Diameter: 1

EQUALIZER

Length of Manifold Segment Equivalent Length: 1
 Nominal Inside Diameter: 1

ORIFICE

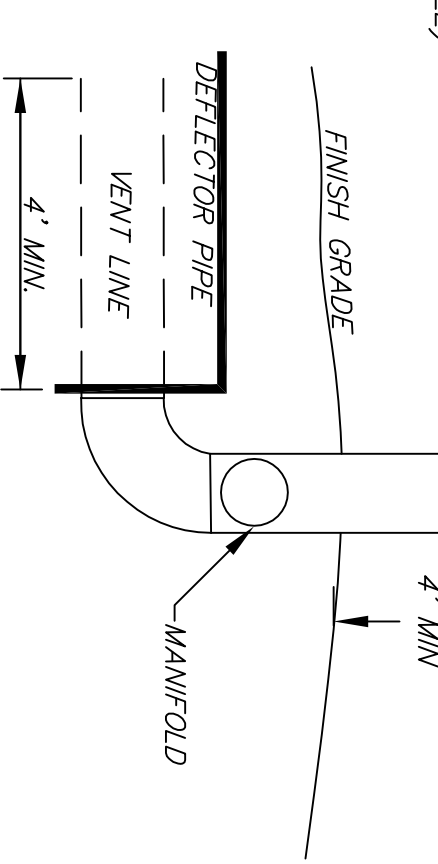
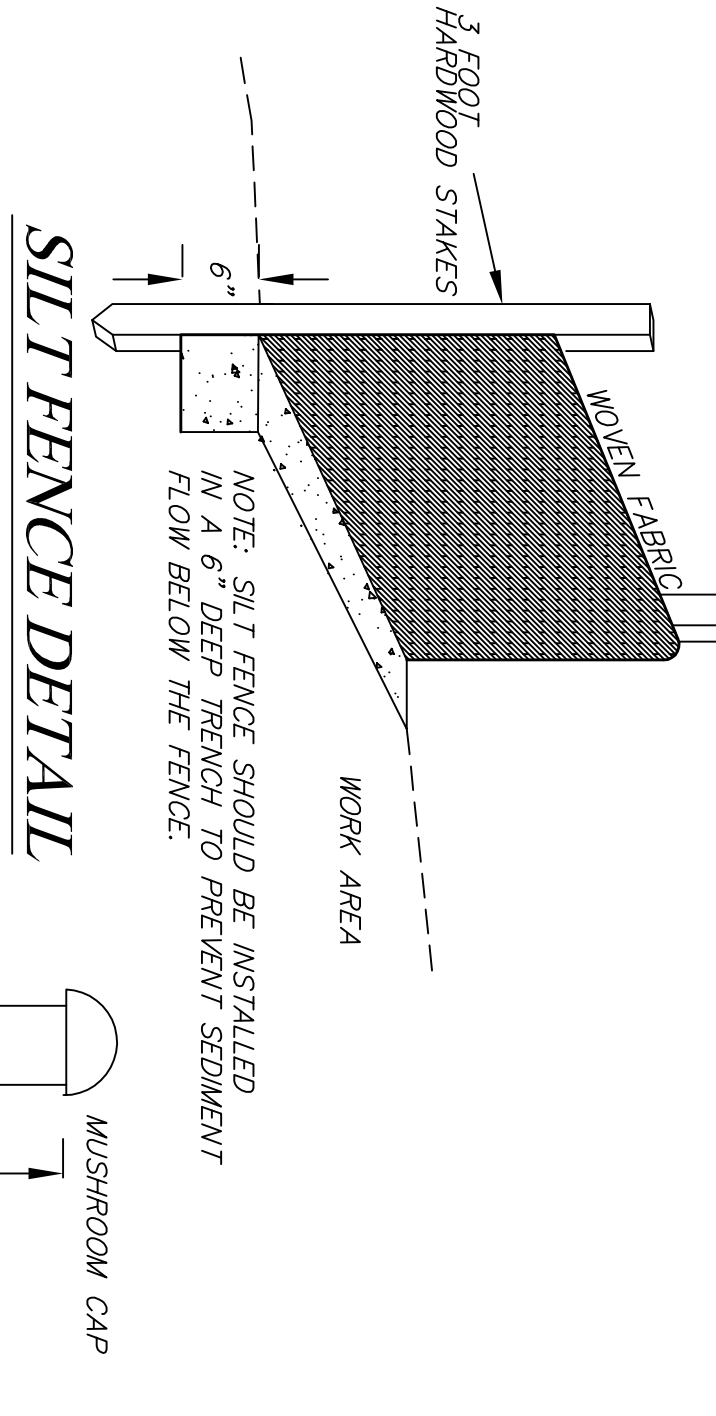
Length of Manifold Segment Equivalent Length: 1
 Nominal Inside Diameter: 1
 Min. Residual Pressure: 0.33
 Office Diameter: 8
 No. of Orifices: 8

SYSTEM PARAMETERS:

ORIFICE DISCHARGE	gall/min	2.88
RESIDUAL PRESSURE	feet	6.4

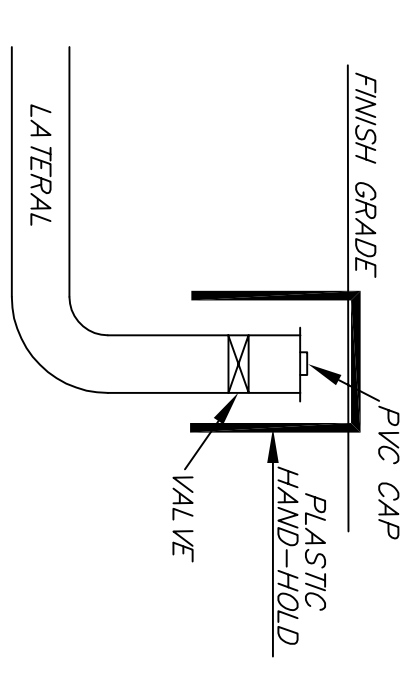
Based on Flow: 48 GPM

NOTE: THIS PLAN IS INTENDED ONLY FOR THE CONSTRUCTION OF A SEPTIC SYSTEM TO SERVE THE SITE. NO OTHER USE OF THIS PLAN IS AUTHORIZED. PROPERTY LINES SHOWN HERE-ON ARE APPROXIMATE AND INTENDED ONLY TO SHOW THAT MINIMUM SETBACKS HAVE BEEN MET. NO BOUNDARY SURVEY WAS PERFORMED IN PREPARATION OF THIS PLAN.
 PRIOR TO CONSTRUCTION OF THIS PLAN, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR THE PROJECT AND SHALL BE A LICENSED SEPTIC INSTALLER IN THE TOWN IN WHICH THE SEPTIC SYSTEM IS BEING INSTALLED.
 DESIGN ENGINEER SHALL VERIFY LOCATION AND ELEVATION OF BENCHMARKS PRIOR TO CONSTRUCTION.
 CONTRACTOR SHALL VERIFY THAT THE DESIGN PLAN DETAILS ARE BENCHMARK ELEVATIONS.
 CONTRACTOR SHALL CONFORM TO THE DESIGN PLAN DETAILS AND THE CURRENT MANUFACTURER'S SPECIFICATIONS.
 DESIGN SHALL BE LESS THAN 10 FEET FROM THE OUTSIDE FACE OF THE FOUNDATION OR CURB OF CONCRETE TO THE STATE PLUMBING CODE.
 ALL WORK SHALL COMPLY WITH 310CMR 15.240 AND LOCAL BOARD OF HEALTH REGULATION, UNLESS VARIANCES/WAIVERS HAVE BEEN APPROVED.
 11. BACKWASH FROM A WATER SOFTENER SHALL NOT BE DISCHARGED INTO A SEPTIC SYSTEM.
 12. LAUNDRY SHALL BE CONNECTED TO PROPOSED SEPTIC SYSTEM.
 13. THERE ARE NO KNOWN WELLS WITHIN 100 FEET OF THE SOIL ABSORPTION SYSTEM OR WITHIN 50 FEET OF THE BOUNDARY OF THE PROPERTY.
 14. THERE ARE FRESHWATER WELLS WITHIN 100 FEET OF THE SEPTIC SYSTEM. THIS PLAN SHALL ACCOMPANY A NOTICE OF INTENT FILED WITH THE LOCAL CONSERVATION COMMISSION AND THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 15. WETLAND ON-SITE WERE Delineated BY METLANDS AND LAND MANAGEMENT, MARCH, 2016.
 16. ALL SEPTIC SYSTEM COMPONENTS ARE GREATER THAN 400 FEET FROM SURFACE WATER SUPPLIES AND GREATER THAN 200 FEET FROM ANY OTHER POTENTIAL SOURCE OF CONTAMINATION.
 17. ALL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF ASTM C-33 SAND AND SHALL CONFORM TO 310CMR 15.259(3).
 19. CONTRACTOR SHALL REMOVE A & B SOIL HORIZON(S) AND OTHER DELETED MATERIAL (INC. EXISTING SAS) WITHIN 5 FT OF SOIL ABSORPTION SYSTEM AND REPLACE WITH ASTM C-33 SAND UP TO BREAKOUT ELEVATION.
 20. COMPONENTS SHALL NOT BE BACKFILLED WITHOUT INSPECTION BY THE BOARD OF HEALTH AND ENGINEER, AND PERMISSION OBTAINED FROM LEACH.
 21. CONTRACTOR SHALL VERIFY THAT THE SEPTIC TANK CAN BE CONNECTED TO THE BUILDING SEWER AS SHOWN, WITH A MINIMUM 2% SLOPE. IF NOT, CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY.
 22. CONTRACTOR SHALL VERIFY THAT THE EXISTING SEPTIC SYSTEM SHALL BE EITHER CRUSHED AND FILLED WITH CLEAN FILL, OR REMOVED, AS PER 310CMR 15.00.
 23. THE EXISTING SEPTIC SYSTEM SHALL BE EITHER CRUSHED AND FILLED WITH CLEAN FILL, OR REMOVED, AS PER 310CMR 15.00.
 24. BACKWASH FROM A WATER SOFTENER SHALL NOT BE DISCHARGED INTO A SEPTIC SYSTEM.
 25. APPROVAL OF THE SEPTIC DESIGN, ISSUANCE OF A DISPOSAL SYSTEM CONSTRUCTION PERMIT AND ISSUANCE OF THE CERTIFICATE OF COMPLIANCE SHALL NOT BE CONSIDERED AS A GUARANTEE THAT THE SEPTIC SYSTEM WILL FUNCTION SATISFACTORILY.
 26. AN OPERATION AND MAINTENANCE CONTRACT IS REQUIRED FOR THE WATERLOO BIOTILER.
 27. THE DESIGN AND INSTALLATION SHALL COMPLY WITH THE MA DEP APPROVAL OF THE WATERLOO BIOTILER 28. BEFORE OBTAINING A CERTIFICATE OF COMPLIANCE FROM THE WEST NEARBY BOARD OF HEALTH THE SYSTEM OWNER SHALL RECORD A DEED NOTICE AT THE ESSEX SOUTH REGISTRY OF DEEDS DISCUSING THE EXISTENCE OF THE ALTERNATIVE ON-SITE SYSTEM INCLUDING THE SECONDARY TREATMENT UNIT.
 29. THE INSTALLER SHALL MAINTAIN ON-SITE AT ALL TIMES DURING CONSTRUCTION, A COPY OF THE APPROVED PLANS AND THE SYSTEM OPERATOR SHALL MAINTAIN COPIES AFTER CONSTRUCTION IS COMPLETED.
 30. THE LEACH FIELD SHALL BE COVERED WITH A 4\"/>



1) VENT LINE MANIFOLD SHALL BE 4\"/>

VENT
 310 GMR 15.241
 (NOT TO SCALE)



FLUSHING CONNECTION
 (NOT TO SCALE)

SUBSURFACE SEWAGE DISPOSAL SYSTEM UPGRADE

41 ANDREWS FARM RD
 BOXFORD, MA 01921

REGISTRY INFORMATION:
 DEED:
 BOOK NO.: 28119
 PAGE NO.: 80

ASSESSORS INFORMATION:
 MAP: 38
 BLOCK: 03
 LOT: 32

PREPARED FOR:
 LEIGHTON LOBELLE
 86 BENNETT HILL RD
 ROWLEY, MA

SCANLAN ENGINEERING LLC
 70 BOX 906-DORCHESTER, MA 01938

PHONE: (978) 372-3440
 FAX: (978) 891-3888
 EMAIL: info@scanlanengineering.com
 WEB: www.scanlanengineering.com

#	BY	DATE	REVISIONS TO PLANS

DATE: APRIL 4, 2016
 DESIGN BY: JBS
 DRAWN BY: JBS

DETAILS & NOTES