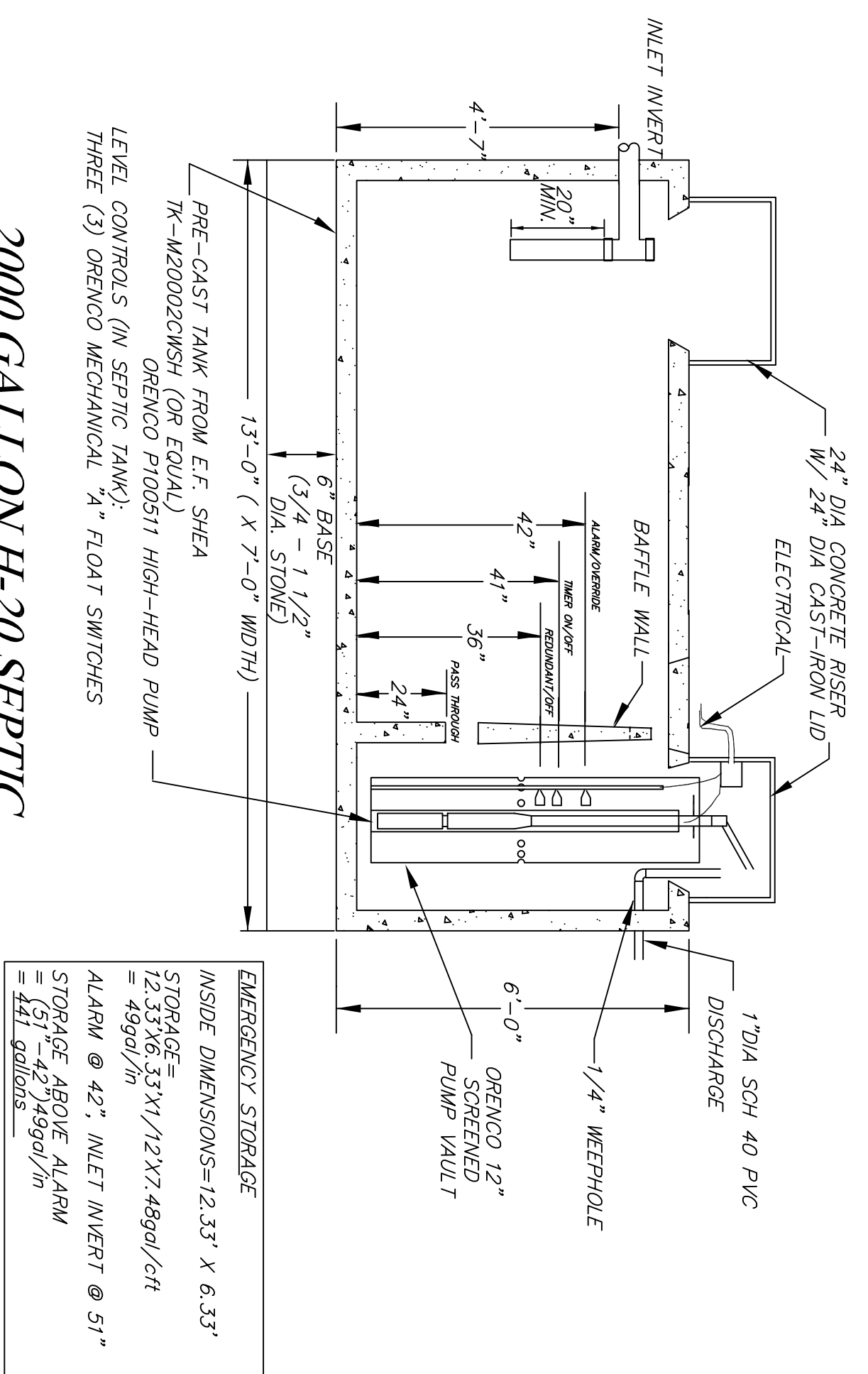
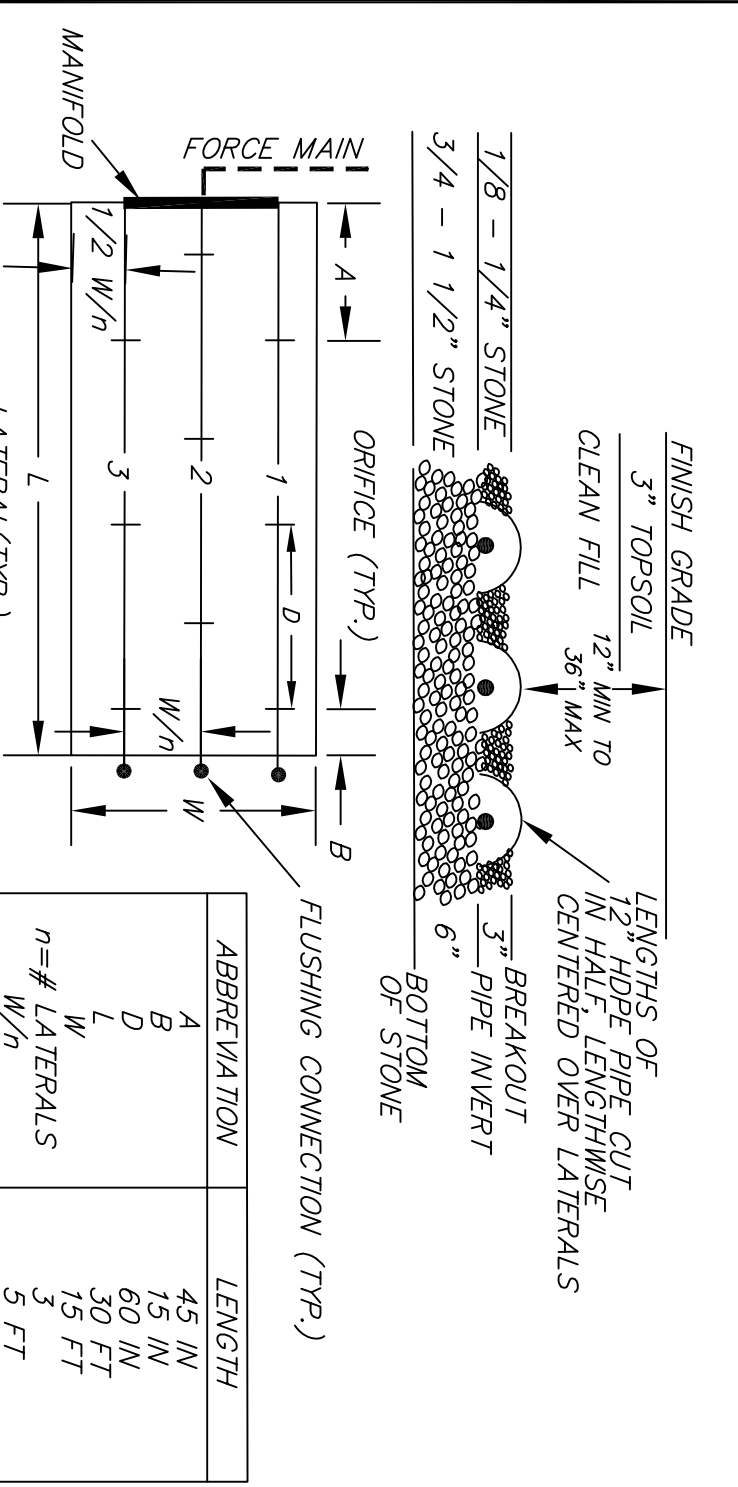
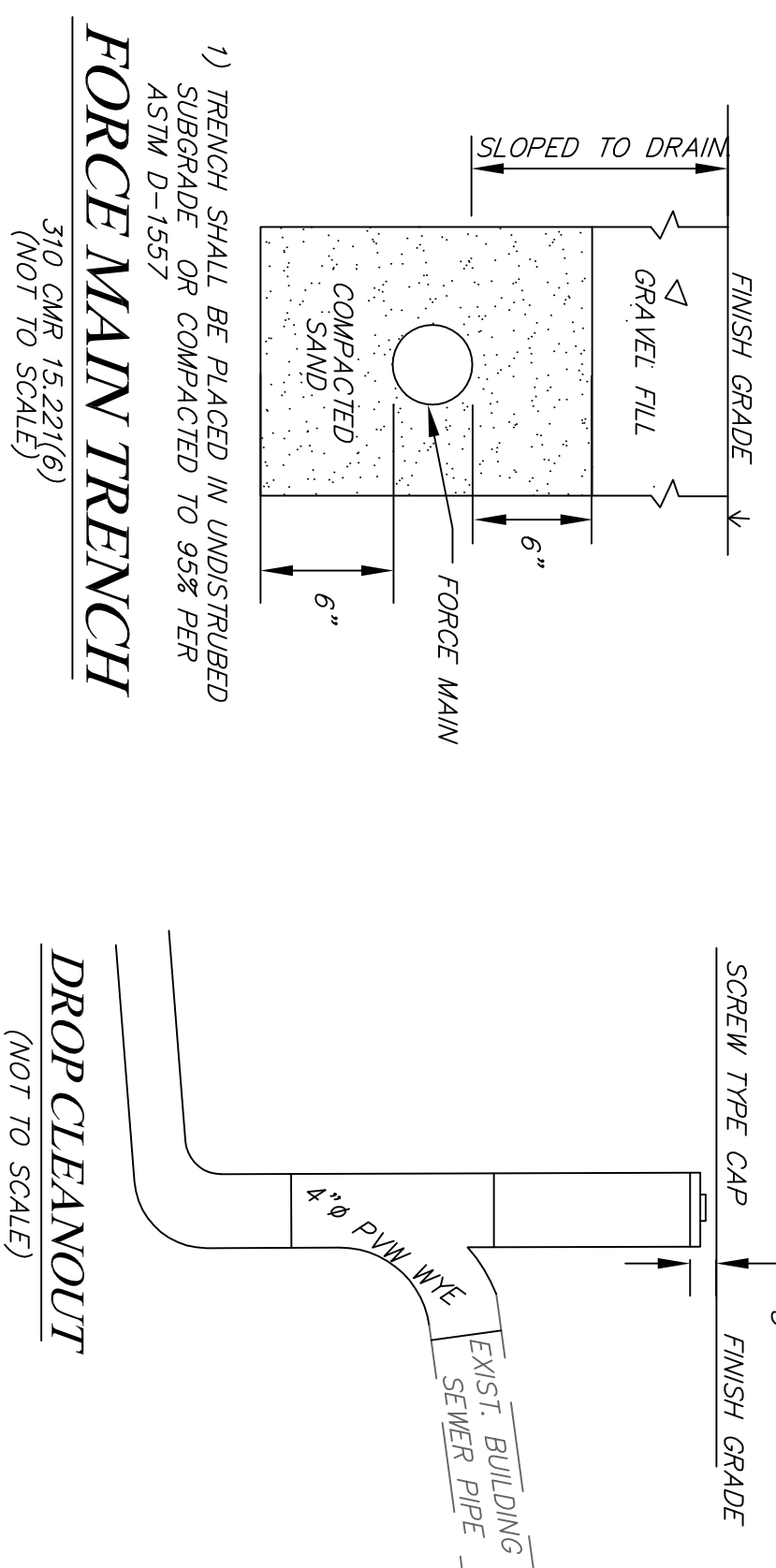


TABLE OF INVERT ELEVATIONS:

ST/IV COMBO IN	97.00	BOTTOM OF STONE	97.00
ST/IV COMBO OUT	96.75	MANIFOLD INVERT	97.00
WATERLOO BIOFILTER IN	97.50	LATERAL INVERT	97.50
WATERLOO BIOFILTER OUT	96.50	TOP OF LINER	97.80



2000 GALLON H-20 SEPTIC TANK WITH PUMP VAULT DETAIL
NOT TO SCALE

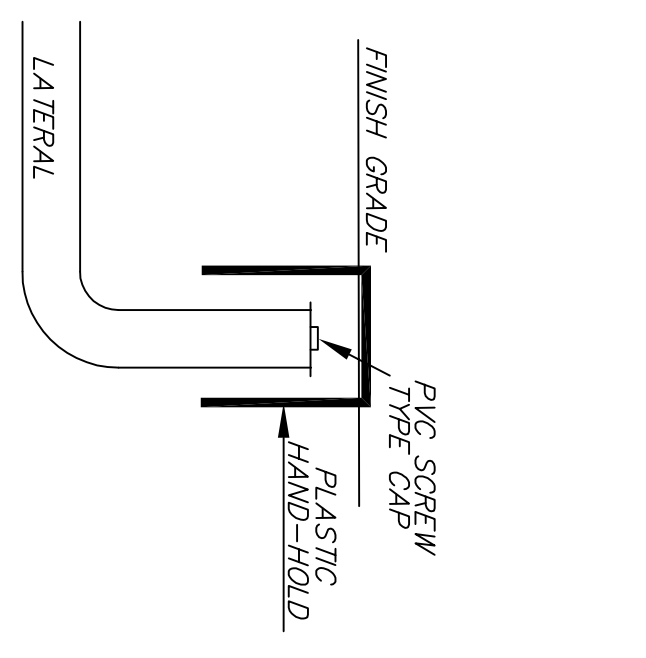


ABBREVIATION	LENGTH
A	45 IN
B	60 IN
D	60 IN
L	30 FT
W	19 FT
n=#	3 FT
n=#	8 7/16 IN

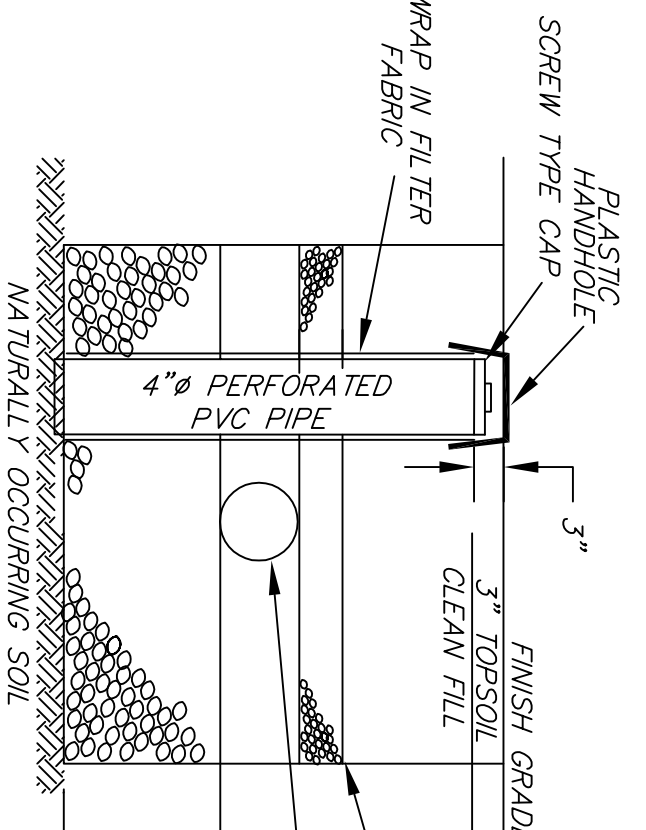
- 1) BOTTOM OF FIELD SHALL BE LEVEL AND SCARPED PRIOR TO PLACING STONE.
- 2) STONE SHALL BE DOUBLE WASHED.
- 3) HAND-HOLDS SHALL BE PLACED OVER FLUSHING CONNECTIONS WITH COVERS.
- 4) (2) ORIFICES IN EACH LATERAL SHALL BE DRILLED IN THE CROWN OF THE PIPE. THE 3RD AND 6TH ORIFICE SHALL BE DRILLED THROUGH THE INVERT TO ALLOW FOR PIPE DRAINAGE.

PRESSURE DOSED LEACH FIELD DETAIL:
310 QMR 15.252 (NOT TO SCALE)

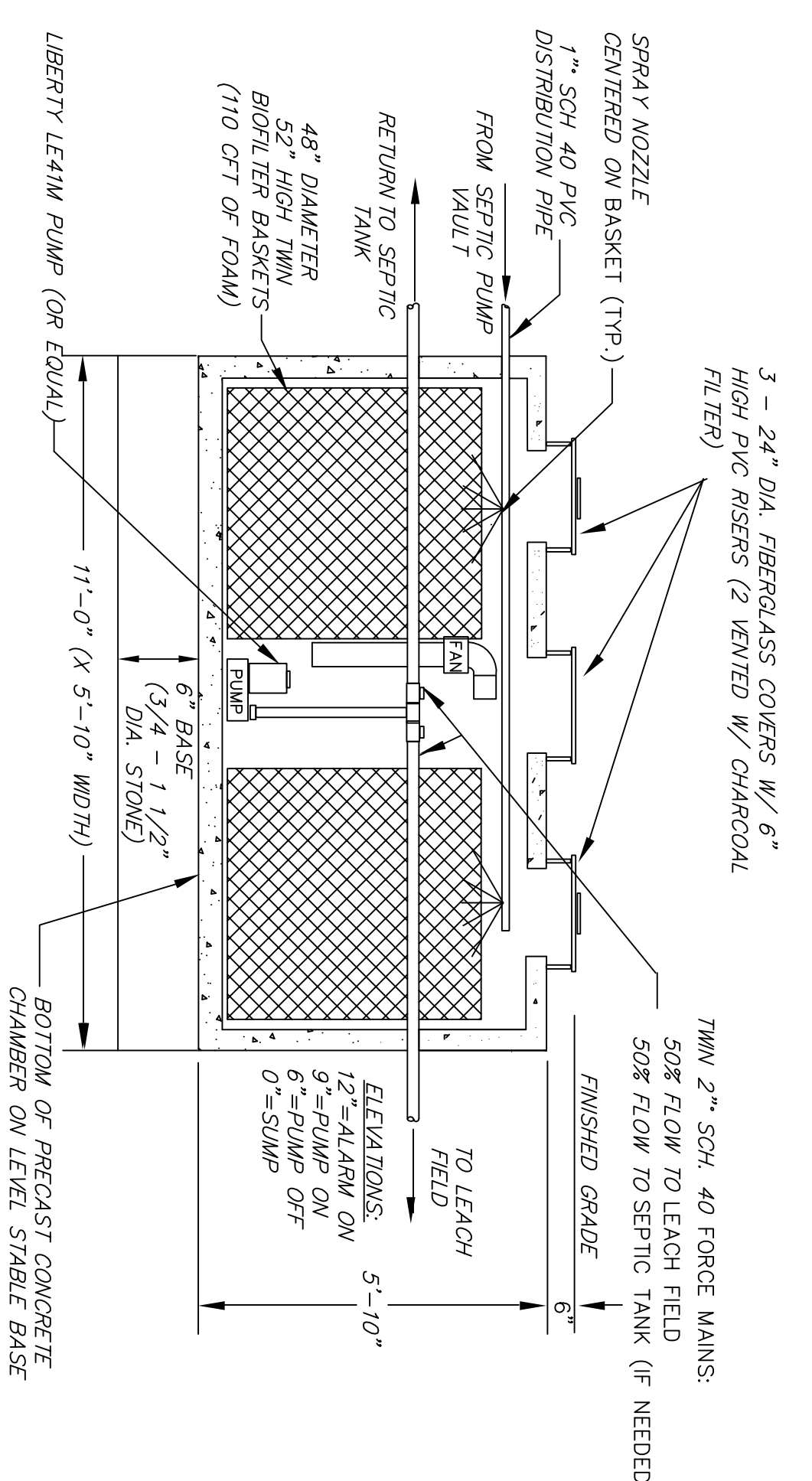
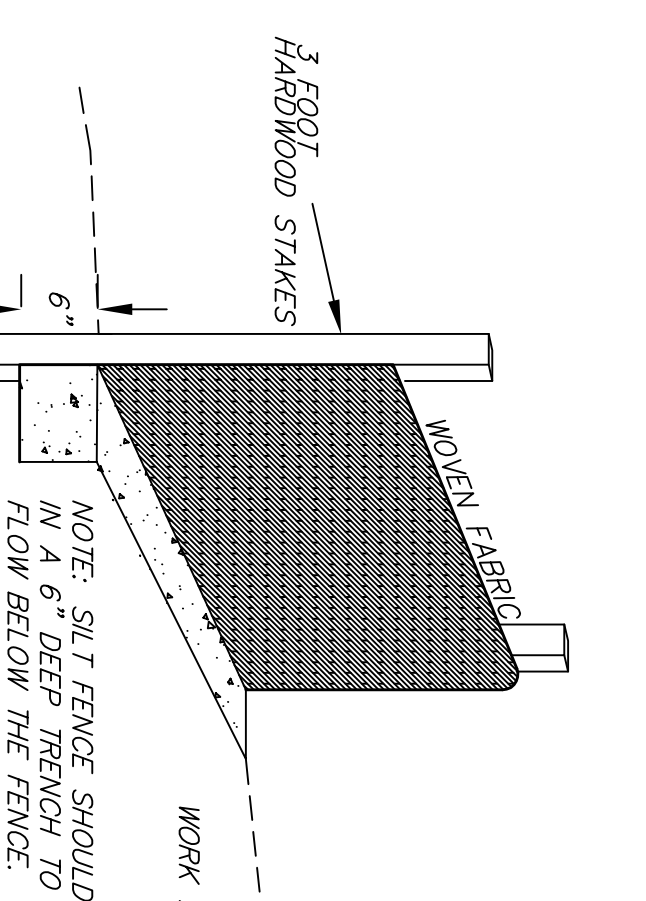
FLUSHING CONNECTION
(NOT TO SCALE)



INSPECTION PORT
310 QMR 15.240(13) (NOT TO SCALE)



SILT FENCE DETAIL
(NOT TO SCALE)



H-20 WATERLOO BIOFILTER™
UG-550 (Design Flow = 350 gpd)
UNIT DELIVERED PRE-ASSEMBLED

NOTE:
ALL WATERLOO BIOFILTER COMPONENTS SHALL BE OBTAINED FROM CLEARWATER INDUSTRIES, IPSWICH, MA (978) 356-0778.

CALCULATE EQUIVALENT LENGTH:

FRICITION LOSSES IN PUMP CHAMBER:	QTY	DIAM. (IN)	LOSS (FITTING) (FT)	FITTING	TOTAL
90° BEND	1	2	5.0	90° BEND	5.0 FT
45° BEND	0	2	2.5	45° BEND	0.0 FT
CHECK VALVE	1	2	14.0	CHECK VALVE	14.0 FT
GATE VALVE	1	2	1.2	GATE VALVE	1.2 FT
TOTAL LOSS					20.2 FT

FRICITION LOSSES IN PIPE RUN:	QTY	DIAM. (IN)	LOSS (FITTING) (FT)	FITTING	TOTAL
90° BEND	2	2	5.0	90° BEND	10.0 FT
45° BEND	2	2	2.5	45° BEND	5.0 FT
TEE (SIDE IN/OUT)	2	2	2.0	TEE (SIDE IN/OUT)	4.0 FT
TEE (END IN/OUT)	2	2	12.0	TEE (SIDE IN/OUT)	24.0 FT
MISC. PIPE					3.2 FT
TOTAL LOSS					67.2 FT

TOTAL EQUIV. LENGTH: 88 FT

PRESSURE DISTRIBUTION SYSTEM PARAMETERS:

GENERAL	Unit	Value	Comment
Dosing Frequency	doses/day	4	
Min. Volume per Dose	gallons	115	
No. of Laterals		3	
FORCE MAIN	feet	32	
Total Equivalent Length	feet	89	
Nominal Inside Diameter	inches	2	
MANIFOLD	feet	2	
Length of Manifold	feet	5	
Segment Equivalent Length	inches	10	
Nominal Inside Diameter	inches	2	
EACH LATERAL	feet	1	
Nominal Inside Diameter	inches	3.0	
Min. Residual Pressure	inches	0.31	
Office Diameter	inches	8	
No. of Offices		60	
Office Spacing	inches	60	

SYSTEM PERFORMANCE SUMMARY

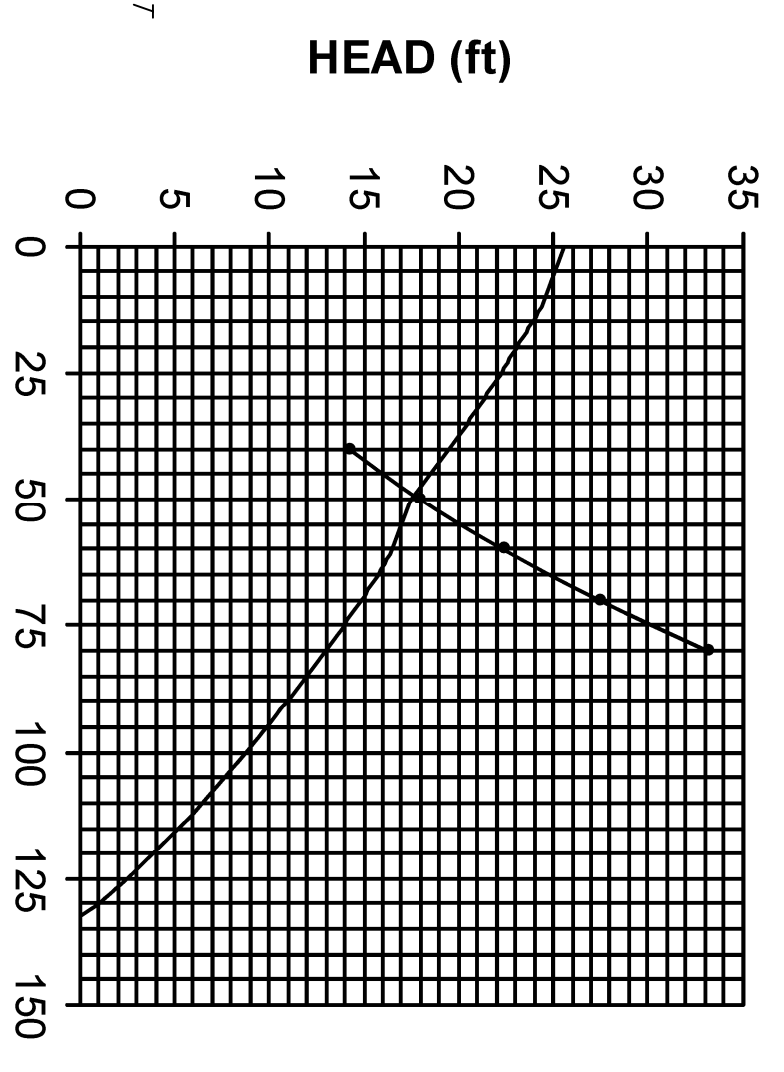
FLOW VELOCITY	ft/sec	ft/sec
Force Main	4.8	
Manifold	2.4	
Lateral	6.4	
ORIFICE DISCHARGE	gal/min	1.98
NETWORK VOLUME	gallons	4
MIN. DOSE VOL./NETWORK VOL.		26
NETWORK DISCHARGE	gal/min	47
RESIDUAL PRESSURE	feet	3.2

COMPOSITE SYSTEM CURVE

Flow (gpm)	Static Head (feet)	Residual Press. at Distal End (feet)	TDH (feet)
40	4.0	3.0	14.2
60	4.0	3.0	17.9
80	4.0	3.0	22.3
70	4.0	3.0	27.4
80	4.0	3.0	33.1

PERFORMANCE CURVE

OPERATING POINT	49	gpm @ 17.5 TDH
TIME ON:	2.2	minutes



- NOTES:**
1. CONTRACTOR SHALL NOTIFY DISASTE AT 1-888-DIG-SAFE (888-233-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
 2. CONTRACTOR SHALL MAKE THEMSELVES AWARE OF ALL CONSTRUCTION REQUIREMENTS ASSOCIATED WITH THE JOB.
 3. CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING SEPTIC SYSTEM AND OTHER SITE IMPROVEMENTS, STATED BY A PROFESSIONAL LAND SURVEYOR/ENGINEER, PRIOR TO CONSTRUCTION.
 4. ANY AND ALL REVISIONS TO THE APPROVED PLAN SHALL BE APPROVED BY THE DESIGN ENGINEER AND THE APPROPRIATE TOWN REPRESENTATIVE.
 5. THE PROJECT WITH RESPECT TO SAFETY METHODS.
 6. 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.
 7. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF BENCHMARKS, PRIOR TO CONSTRUCTION.
 8. CONTRACTOR SHALL VERIFY THAT THE DESIGN PLAN DETAILS ARE CONSISTENT WITH THE CURRENT MANUFACTURER'S SPECIFICATIONS.
 9. APPROVAL OF THE SEPTIC DESIGN, ISSUANCE OF A DISPOSAL SYSTEM CONSTRUCTION PERMIT AND ASSURANCE OF THE CERTIFICATE OF COMPLIANCE SHALL NOT BE CONSIDERED AS A GUARANTEE THAT THE SYSTEM WILL PERFORM AS INTENDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE BOURBORO CONSERVATION COMMISSION.
 11. ALL WORK SHALL COMPLY WITH 310CMR15.000 AND LOCAL BOARD OF HEALTH REGULATION, UNLESS VARIANCES/AMENDMENTS HAVE BEEN APPROVED.
 12. ALL WORK OUTSIDE OF THE BUILDING THAT IS LESS THAN 10 FEET FROM THE OUTSIDE FACE OF THE FOUNDATION SHALL CONFORM TO 248CMR2.00, THE STATE PLUMBING CODE.
 13. ALL SEPTIC SYSTEM COMPONENTS ARE GREATER THAN 400 FEET FROM SURFACE WATER SUPPLY, SUPPLES AND GREATER THAN 200 FEET FROM ANY TRIBUTARY TO A SURFACE WATER SUPPLY.
 14. THE EXISTING WELL IS WITHIN 100 FEET OF THE SOIL ABSORPTION SYSTEM BUT NOT WITHIN 50 FEET OF ANY SEPTIC COMPONENTS.
 15. THE SOIL ABSORPTION SYSTEM AND THESE PLANS SHALL ACCOMPANY A FILING WITH THE BOURBORO CONSERVATION COMMISSION.
 16. ALL SEPTIC COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.
 17. SOIL REPLACEMENT FOR SYSTEM SHALL BE ASTM-C33 SAND.
 18. SOIL REPLACEMENT FOR SYSTEM SHALL BE ASTM-C33 SAND.
 19. COMPONENTS SHALL NOT BE BACKFILLED WITHOUT INSPECTION BY THE BOARD OF HEALTH AND ENGINEER, AND PERMISSION OBTAINED FROM EACH.
 20. VEHICULAR TRAFFIC, PARKING OF VEHICLES, STOCKPILING OF MATERIALS AND STORAGE OF EQUIPMENT OVER LEACHING AREAS IS PROHIBITED.
 21. THE EXISTING SEPTIC SYSTEM SHALL BE EITHER CRUSHED AND FILLED WITH CLEAN FILL, OR REMOVED, AND RELOCATED 100 FEET+ FROM SOIL ABSORPTION SYSTEM.
 22. THE LEACH FIELD LATERALS SHALL BE FLUSHED ANNUALLY TO MAINTAIN A PROPERLY WORKING SYSTEM.
 23. CONTRACTOR SHALL REMOVE A & B SOIL HORIZON AND REPLACE WITH ASTM-C33 SAND.
 24. CONTRACTOR SHALL VERIFY THAT THE BUILDING SEWER CAN BE CONNECTED TO THE SEPTIC TANK WITH A MINIMUM 2% SLOPE. IF NOT, CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY.
 25. AN OPERATION AND MAINTENANCE CONTRACT IS REQUIRED FOR THE WATERLOO BIOFILTER.
 26. THE DESIGN AND INSTALLATION SHALL COMPLY WITH THE MA DEP REMEDIAL APPROVAL OF THE WATERLOO BIOFILTER DATED: NOVEMBER 5, 2012.
 27. PRIOR TO OBTAINING A CERTIFICATE OF COMPLIANCE FROM THE BOURBORO BOARD OF HEALTH THE SYSTEM OWNER SHALL RECORD A DEED NOTICE AT THE ESSEX SOUTH REGISTRY OF DEEDS DISCLOSING THE EXISTENCE OF THE WATERLOO BIOFILTER.
 28. THE EXISTING WELL SHALL BE TESTED PRIOR TO CONSTRUCTION, IF THE WELL FAILS IT SHALL BE REPLACED AND RELOCATED 100 FEET+ FROM SOIL ABSORPTION SYSTEM.
 29. LAUNDRY SHALL BE CONNECTED TO PROPOSED SEPTIC SYSTEM.

SUBSURFACE SEWAGE DISPOSAL SYSTEM UPGRADE

310 IPSWICH ROAD
BOXFORD, MA

REGISTRY INFORMATION:

DEED:
BOOK NO.: 4244
PAGE NO.: 150

ASSESSORS INFORMATION:

MAP: 19
BLOCK: 1
LOT: 8

PREPARED FOR:

HAROLD WHITE
310 IPSWICH ROAD
BOXFORD, MA



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

#	BY	DATE	REVISIONS TO PLANS

DATE: JUNE 19, 2014
DESIGN BY: TME
CHECKED BY: JES

DETAILS & NOTES

SHEET 2 OF 2
SCALE: 1" = 20'
PROJECT # 0604