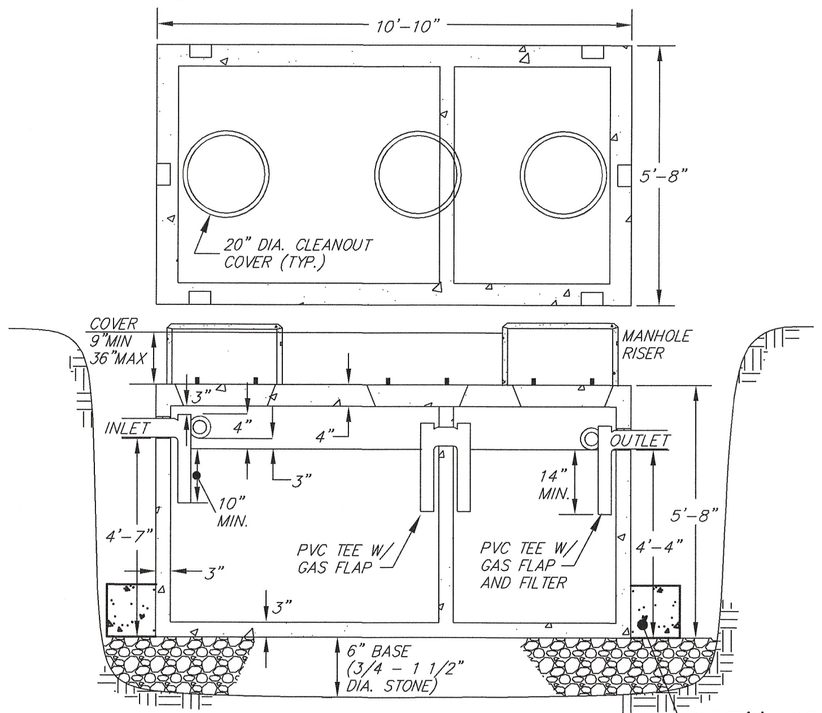
1) FIRST COMPARTMENT: 660 GALLONS
2) SECOND COMPARTMENT: 330 GALLONS
2 COMP. 1000/500 GALLON MONOLITHIC SEPTIC TANK
3) PROVIDED:



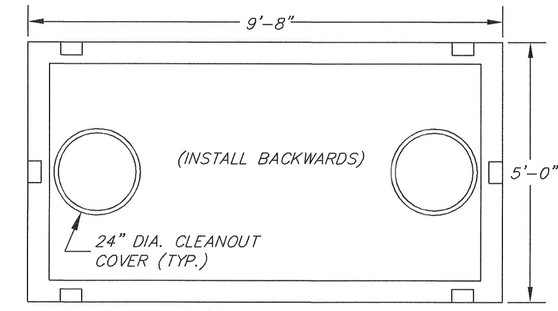
SHEA CONCRETE MODEL TK-M15002C STANDARD, OR EQUAL
WEIGHT OF TANK= 11641 LBS + BALLAST

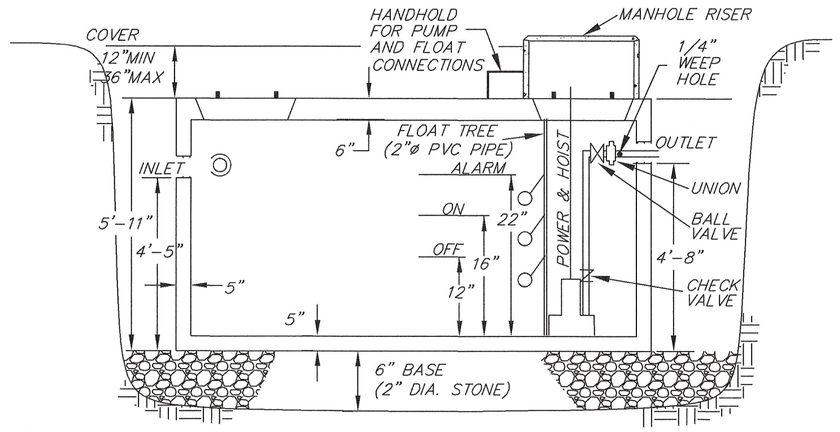
0.5 FT(H) x 0.5 FT(W) CONCRETE EXTENDED BASE

NOTES:
1) TANK SHALL BE WATERTIGHT THROUGH MANUFACTURER'S SPECIFICATIONS AND WARRANTY.
2) TANK SHALL BE SET LEVEL AND TRUE TO GRADE ON A LEVEL BASE WHICH HAS BEEN MECHANICALLY COMPACTED.
3) TANK SHALL BE EMBOSSED WITH A SEAL STATING THAT ASTM STANDARD C 1227-93 HAS BEEN MET.
4) THE OUTLET TEE SHALL BE EQUIPPED WITH A GAS BAFFLE AND AN EFFLUENT FILTER (ZABEL A-1800 OR EQUAL).
5) THE INLET & OUTLET COVERS SHALL HAVE A RISER TO FINISH GRADE.
6) SECURE COVERS TO PREVENT UNAUTHORIZED ACCESS.
7) TANK IS A SPECIAL ORDER. CONTACT TANK MANUFACTURER FOR EXTENDED BASE.

1500 GALLON MONOLITHIC SEPTIC TANK WITH EXTENDED BASE

310 CMR 15.223 - 15.228 (NOT TO SCALE)





NOTES:
1) TANK SHALL BE WATERTIGHT THROUGH MANUFACTURER'S SPECIFICATIONS AND WARRANTY.
2) TANK SHALL BE SET LEVEL AND TRUE TO GRADE ON A LEVEL BASE WHICH HAS BEEN MECHANICALLY COMPACTED.
3) TANK SHALL BE EMBOSSED WITH A SEAL STATING ASTM STANDARD C 1227-93 HAS BEEN MET.
4) PUMP SHALL BE ON A SEPARATE CIRCUIT FROM ALARM.
5) ALARM AND PUMP CONTROLS SHALL BE ACCESSIBLE TO LIVING UNIT.
6) PUMP AND FLOAT CONNECTIONS SHALL BE PLACED IN A HANDHOLD ADJACENT TO THE OUTLET MANHOLE RISER.
7) MANHOLE RISERS REQUIRED: TO-GRADE FOR OUTLET.
8) SECURE COVERS AT-GRADE TO PREVENT UNAUTHORIZED ACCESS.

SHEA CONCRETE MODEL M1000H H-20 (6" TOP) OR EQUAL. (WT:14,825 LBS)

1000 GALLON MONOLITHIC H-20 PUMP CHAMBER (INSTALL BACKWARDS)

310 CMR 15.231 (NOT TO SCALE)

PUMP SPECIFICATIONS:

MANUFACTURER:	LIBERTY PUMPS
MODEL #:	LE41M
NO. REQUIRED:	ONE (1)
HORSEPOWER:	0.4
PHASE:	1
FULL AMPS:	12
DISCHARGE:	2"

PUMP ACCESSORIES:

CONTROL PANEL:	LIBERTY SXL24=3 INCLUDED
ALARM:	VISUAL & AUDIBLE INCLUDED
FLOATS:	PILOT-DUTY FLOAT SWITCHES
NO. REQUIRED:	3

PUMP CHAMBER SPECIFICATIONS:

STORAGE

DOSAGE	82.5	gallons
RESERVE	330.0	gallons
VOL. IN PIPE RUN	0.0	gallons
TOTAL	412.5	gallons

DIMENSIONS	PUMP CHAMBER	
LENGTH*	8.83	feet
WIDTH*	4.18	feet
DEPTH*	4.00	feet

*INSIDE DIMENSIONS

ELEVATIONS

INLET INVERT	99.50	feet
ALARM	97.3	feet
ON	96.8	feet
OFF	96.5	feet
SUMP	95.5	feet

CALCULATE STATIC HEAD:

DISCHARGE ELEV.	104.50	feet
PUMP OFF ELEV.	96.5	feet
TOTAL STATIC HEAD	8.0	feet

CALCULATE EQUIVALENT LENGTH:

FRICTION LOSSES IN PUMP CHAMBER:

QTY	DIA (IN)	LOSS/FITTING (FT)	FITTING	TOTAL
1	2.129	5.0	90° BEND	5.0 FT
0	2.129	2.5	45° BEND	0.0 FT
1	2.129	14.0	CHECK VALVE	14.0 FT
1	2.129	1.2	GATE VALVE	1.2 FT
TOTAL LOSS		⇨ 21.0 FT		20.2 FT

FRICTION LOSSES IN PIPE RUN:

QTY	DIA (IN)	LOSS/FITTING (FT)	FITTING	TOTAL
2	2.129	5.0	90° BEND	10.0 FT
0	2.129	2.5	45° BEND	0.0 FT
0	2.129	2.0	22.5° BEND	0.0 FT
0	2.129	12.0	TEE (Side In/Out)	0.0 FT
			LENGTH OF RUN	58.0 FT
			MISC. PIPE	5.8 FT
TOTAL LOSS		⇨ 74.0 FT		73.8 FT

TOTAL EQUIV. LENGTH: ⇨ ⇨ 95 FT

PRESSURE DISTRIBUTION SYSTEM PARAMETERS:

GENERAL	Unit	Value	Comment
Dosing Frequency	doses / day	4	
Min. Volume per Dose	gallons	83	
No. of Laterals		5	
FORCE MAIN			
Length of Force Main	feet	58	
Total Equivalent Length	feet	95	
Nominal Inside Diameter	inches	2	
MANIFOLD			
No. of Segments		2	
Length of Manifold		12	
Segment Equivalent Length	feet	17	
Nominal Inside Diameter	inches	2	(1=include 2=exclude)
EACH LATERAL			
Length of Lateral	feet	50	
Nominal Inside Diameter	inches	1.25	
Min. Residual Pressure	feet	3.5	
Orifice Diameter	inches	0.19	0.19=3/16;0.31=5/16; 0.44=7/16;0.56=9/16
No. of Orifices		12	Includes 2 Orifices in pipe invert
Orifice Spacing	inches	60	maximum = 60 inches

BUOYANCY CALCULATIONS:

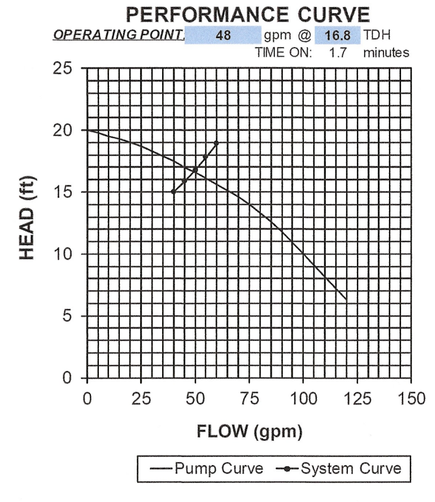
1500 GALLON TWO-COMPARTMENT H-10 S/T			
TANK WEIGHT	11641	LBS	
BALLAST WEIGHT	1295	LBS	
SOIL WEIGHT	18820	LBS	
TOTAL DOWNWARD FORCE	**31756**	**LBS**	
TOTAL UPWARD FORCE	**18862**	**LBS**	(DISPLACED WATER)
FACTOR OF SAFETY	**1.68**		
1000 GALLON H-20 PUMP CHAMBER			
TANK WEIGHT	14825	LBS	
BALLAST WEIGHT	0	LBS	
SOIL WEIGHT	5371	LBS	
TOTAL DOWNWARD FORCE	**20196**	**LBS**	
TOTAL UPWARD FORCE	**15085**	**LBS**	(DISPLACED WATER)
FACTOR OF SAFETY	**1.34**		

NOTES:
1. 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.
2. CONTRACTOR SHALL NOTIFY DIGSAFE AT 1-888-DIG-SAFE (888-233-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
3. CONTRACTOR SHALL MAKE THEMSELVES AWARE OF ALL CONSTRUCTION REQUIREMENTS ASSOCIATED WITH THE JOB.
4. ANY AND ALL REVISIONS TO THE APPROVED PLAN SHALL BE APPROVED BY THE DESIGN ENGINEER AND THE APPROPRIATE TOWN REPRESENTATIVE.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROJECT WITH RESPECT TO SAFETY METHODS, CONSTRUCTION METHODS AND SUPERVISION OF WORKERS.
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. DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES IN THE BENCHMARK ELEVATIONS.
8. CONTRACTOR SHALL CONFIRM 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 ISSUANCE OF THE CERTIFICATE OF COMPLIANCE SHALL NOT BE CONSTRUED AS A GUARANTEE THAT THE SEPTIC SYSTEM WILL FUNCTION SATISFACTORILY.
10. BACKWASH FROM A WATER SOFTENER SHALL NOT BE DISCHARGED INTO A SEPTIC SYSTEM.
11. WASHING MACHINE, IF CURRENTLY SEPARATE, SHALL BE CONNECTED TO THE PROPOSED SEPTIC SYSTEM.
12. ALL WORK SHALL COMPLY WITH 310CMR15.000 AND LOCAL BOARD OF HEALTH REGULATION, UNLESS VARIANCES/WAIVERS HAVE BEEN APPROVED.
13. ALL WORK OUTSIDE OF THE BUILDING THAT IS LESS THAN 10 FEET FROM THE OUTSIDE FACE OF THE BUILDING, SHALL CONFORM TO 248CMR2.00, THE STATE PLUMBING CODE.
14. ALL SEPTIC SYSTEM COMPONENTS ARE GREATER THAN 400 FEET FROM SURFACE WATER SUPPLIES AND GREATER THAN 200 FEET FROM ANY TRIBUTARY TO A SURFACE WATER SUPPLY.
15. THERE ARE NO KNOWN WELLS WITHIN 100 FEET OF THE SOIL ABSORPTION SYSTEM OR WITHIN 50 FEET OF ANY SEPTIC COMPONENTS.
16. THERE ARE NO KNOWN WETLANDS WITHIN 100 FEET OF THE SOIL ABSORPTION SYSTEM OR WITHIN 100 FEET OF ANY SEPTIC COMPONENTS.
17. THERE ARE FRESHWATER WETLANDS WITHIN 100 FEET OF A PORTION 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.
18. WETLAND ONSITE WERE DELINEATED BY JULIE VONDRAK, JANUARY, 2022.
19. SITE COMPLIES WITH 310CMR15.214: NITROGEN LOADING LIMITATIONS.
20. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF SELECT ON-SITE OR IMPORTED SOIL MATERIAL AND SHALL CONFORM TO 310CMR15.255(3).
21. CONTRACTOR SHALL REMOVE A & B SOIL HORIZON(S) AND OTHER DELETERIOUS MATERIAL WITHIN 5 FT OF SOIL ABSORPTION SYSTEM AND REPLACE WITH FILL MATERIAL (CONFORMING TO 310CMR15.225(5)) UPTO BREAKOUT ELEVATION AND DOWN TO THE DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL.
22. COMPONENTS SHALL NOT BE BACKFILLED WITHOUT INSPECTION BY THE BOARD OF HEALTH AND ENGINEER, AND PERMISSION OBTAINED FROM EACH.
23. VEHICULAR TRAFFIC, PARKING OF VEHICLES, STOCKPILING OF MATERIALS AND STORAGE OF EQUIPMENT OVER LEACHING AREA IS PROHIBITED.
24. THE EXISTING SEPTIC SYSTEM SHALL BE EITHER CRUSHED AND FILLED WITH CLEAN FILL, OR REMOVED, AS PER 310CMR15.00.
25. ALL SEPTIC COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.
26. THE LEACH FIELD LATERALS SHALL BE FLUSHED ANNUALLY TO MAINTAIN A PROPERLY WORKING SYSTEM.
27. CONTRACTOR SHALL PROVIDE 24 HOUR NOTICE TO THE DESIGN ENGINEER TO INSPECT CONSTRUCTION AT THE FOLLOWING TIMES:
   A) TO INSPECT INSTALLED TANKS -- PRIOR TO BACKFILLING
   B) TO INSPECT THE BOTTOM OF EXCAVATION -- PRIOR TO SAND PLACEMENT
   C) TO INSPECT THE FINAL INSTALLATION -- PRIOR TO BACKFILLING
28. CONTRACTOR SHALL CONFIRM THAT THE PROPOSED BUILDING SEWER PIPE INVERT ELEVATION CAN BE MET. WITH A MINIMUM SLOPE OF 1.5% IF NOT, THEN DESIGN ENGINEER SHALL BE NOTIFIED, IMMEDIATELY.

COMPOSITE SYSTEM CURVE

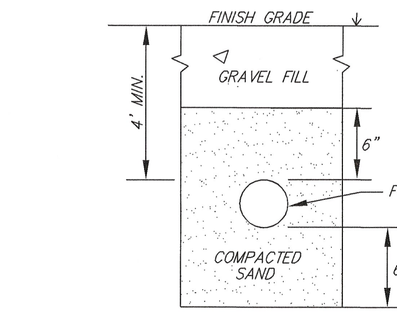
Flow (gpm)	Static Head (feet)	Residual Press. at Distal End	TDH (feet)
40	8.0	3.5	**15.0**
45	8.0	3.5	**15.9**
50	8.0	3.5	**16.8**
55	8.0	3.5	**17.8**
60	8.0	3.5	**18.9**

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



SYSTEM PARAMETERS-

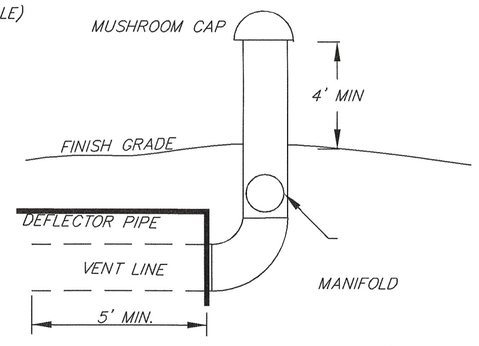
ORIFICE DISCHARGE	**gal/min**	**0.80**
RESIDUAL PRESSURE (SQUIRT HEIGHT)	*feet*	***3.5***
Based on Flow:		***48 GPM***



1) TRENCH SHALL BE PLACED IN UNDISTRUBED SUBGRADE OR COMPACTED TO 95% PER ASTM D-1557

FORCE MAIN TRENCH

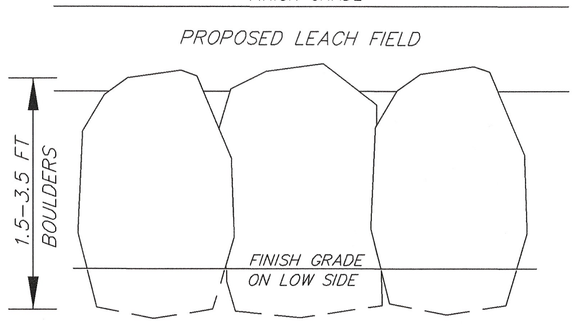
310 CMR 15.221(6) (NOT TO SCALE)



1) VENT LINE/MANIFOLD SHALL BE 4"ø SCH-40 PVC PIPE
2) VENT PIPE SHALL HAVE A CHARCOAL FILTER
3) OWNER SHALL BE CONSULTED REGARDING PLACEMENT OF VENT.

VENT

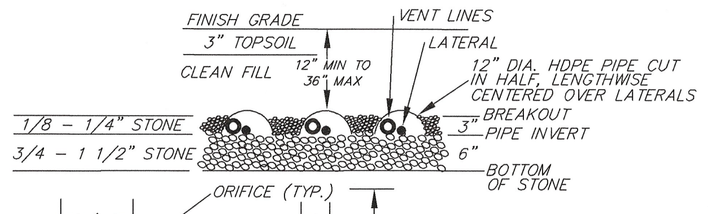
310 CMR 15.241 (NOT TO SCALE)

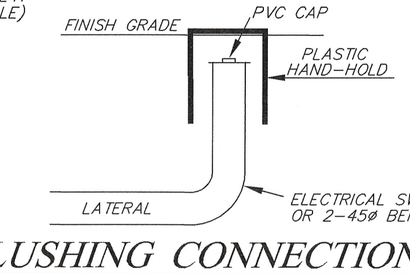


40 MIL LINER TO BE PLACED BEHIND BOULDERS.

BOULDER WALL:

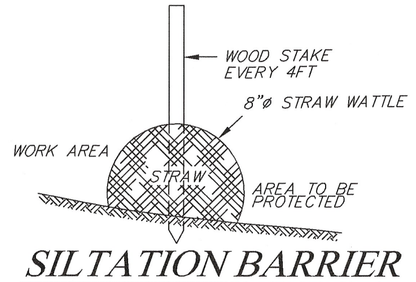
(NOT TO SCALE)





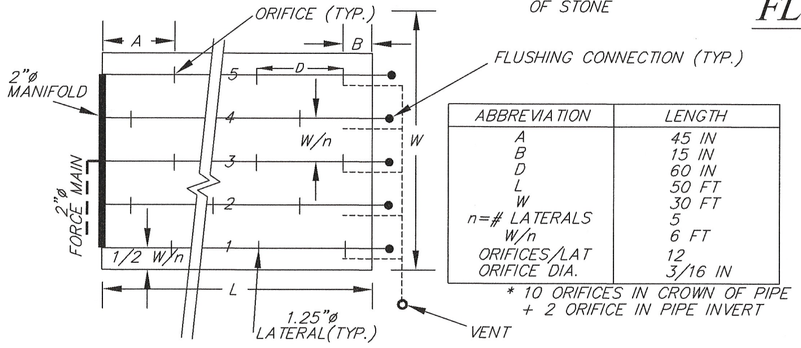
FLUSHING CONNECTION

(NOT TO SCALE)



SILTATION BARRIER

(NOT TO SCALE)



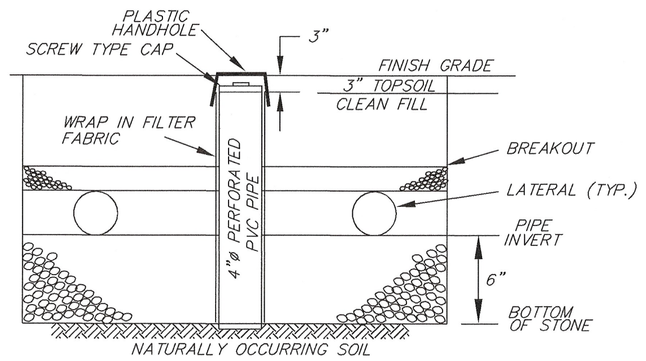
ABBREVIATION	LENGTH
A	45 IN
B	15 IN
D	60 IN
L	50 FT
W	30 FT
n=# LATERALS	5
W/n	6 FT
ORIFICES/LAT	12
ORIFICE DIA.	3/16 IN

* 10 ORIFICES IN CROWN OF PIPE + 2 ORIFICE IN PIPE INVERT

1) BOTTOM OF EXCAVATION SHALL BE LEVEL AND SCARIFIED PRIOR TO PLACING STONE.
2) THIRD & EIGHTH ORIFICE IN EACH LINE SHALL BE DRILLED THROUGH PIPE CREATING TWO ORIFICES FACING DOWNWARD, TO DRAIN PIPE.

PRESSURE DOSED LEACH FIELD DETAIL:

310 CMR 15.252 (NOT TO SCALE)



INSPECTION PORT

310 CMR 15.240(13) (NOT TO SCALE)

SUBSURFACE SEWAGE DISPOSAL SYSTEM UPGRADE

702 MAIN STREET
BOXFORD, MA

REGISTRY INFORMATION:
DEED:
BOOK NO.: 40272
PAGE NO.: 155

ASSESSORS INFORMATION:
MAP: 5
BLOCK: 2
LOT: 20

PREPARED FOR:
LEGACY-NORTH PROPERTIES INC
4 ASHBURY LANE
ANDOVER MA 01810

SCANLAN ENGINEERING LLC
PO BOX 906-GEORGETOWN, MA 01833
PHONE: (978) 372-3440
FAX: (978) 891-3888
EMAIL: info@scanlanengineering.com
WEB: www.scanlanengineering.com

COMMONWEALTH OF MASSACHUSETTS
JAMES B. SCANLAN
CIVIL
No. 46239
REGISTERED PROFESSIONAL ENGINEER
8/14/22

#	BY	DATE	REVISIONS TO PLANS
3	JBS	8/14/22	ADD BARN & B FLAGS
2	JBS	8/11/22	CONSERVATION REVISIONS
1	JBS	7/18/22	CONSERVATION FILING

DATE: JANUARY 26, 2022
DESIGN BY: JBS
DRAWN BY: JBS

DETAILS & NOTES

SHEET 2 OF 2 SCALE: 1"= 20'

PROJECT # 1109