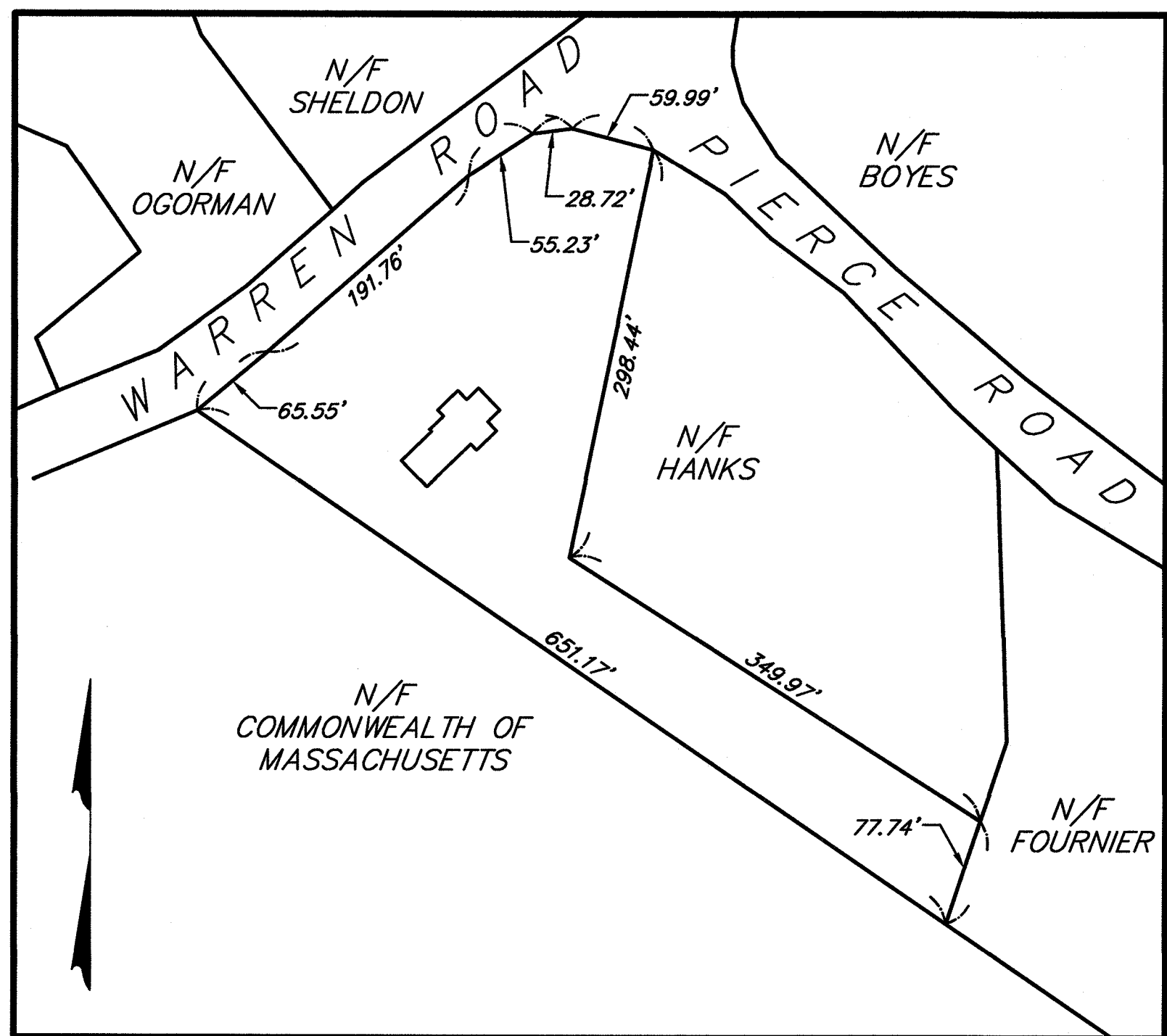
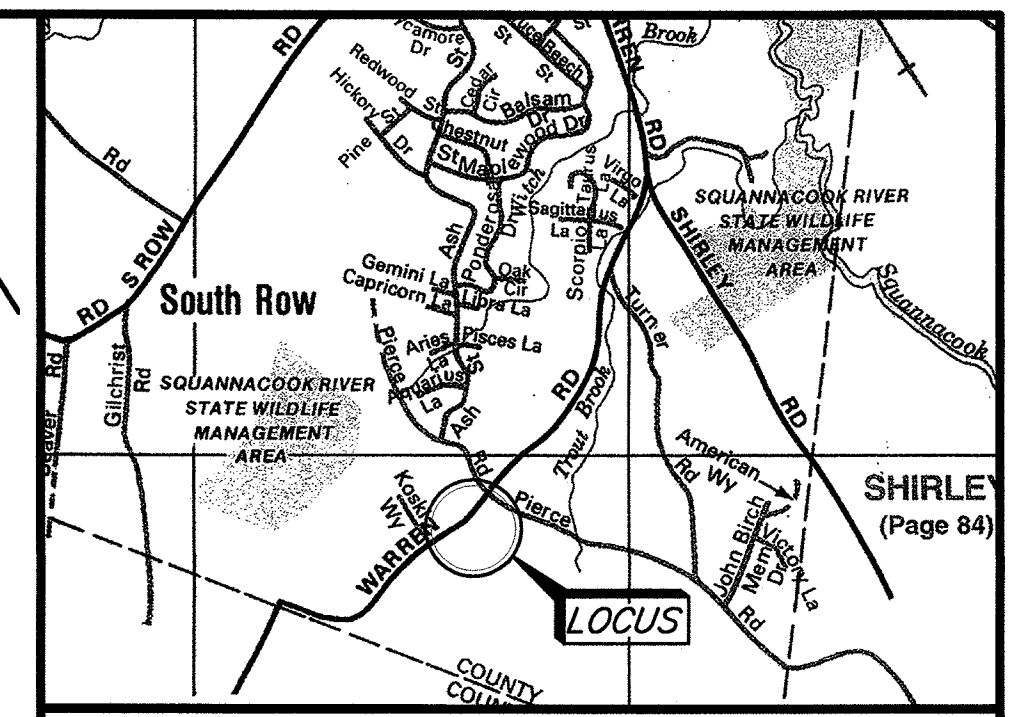
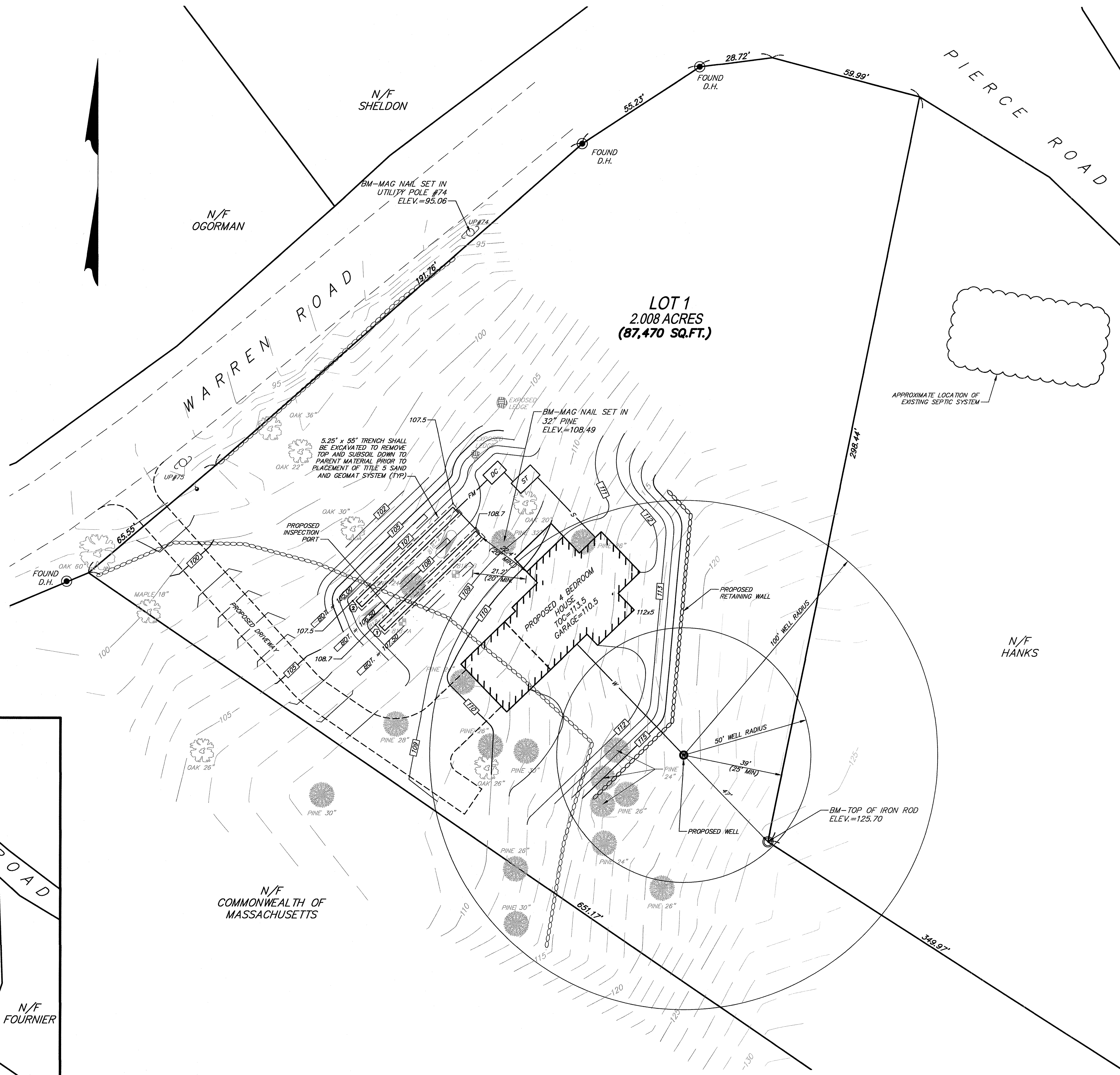


PROJECT NAME: HANKS	ST (H-10)	PLAN #: L-14172
JOB NUMBER: 32548		DATE: 12/28/2020
<b>BUOYANCY CALCULATIONS</b>		
DESCRIPTION: SEPTIC TANK		
TANK MANUFACTURER: SHEA		
ITEM NUMBER: TR-100 (H-10)		
TANK SIZE: 1,500 GAL.		
OUTSIDE DIMENSIONS:	LENGTH = 10.50 R.	ASSUMPTIONS: $\gamma_{water} = 62.4 \text{ lb/ft}^3$
	WIDTH = 5.67 R.	$\gamma_{soil} = 150.0 \text{ lb/ft}^3$
	HEIGHT = 5.67 R.	$\gamma_{soil} = 110.0 \text{ lb/ft}^3$
INSIDE DIMENSIONS:	LENGTH = 10.00 R.	
	WIDTH = 5.17 R.	
	HEIGHT = 5.00 R.	
SEASONAL HIGH GROUNDWATER ELEVATION =	104.0 R.	
TOP OF TANK ELEVATION =	107.4 R.	
BOTTOM OF TANK ELEVATION =	101.0 R.	
DEPTH OF SOIL COVER PROPOSED =	0.75 R.	
UPWARD FORCE OF GROUNDWATER (F)		
$F = PA$		
WHERE:	$P = (\text{GROUNDWATER ELEV.} - \text{BOT. OF TANK ELEV.}) \times \gamma_{water}$	
$A = \text{AREA OF TANK}$		
$F =$	7,000 Lb.	
DOWNWARD WEIGHT OF EMPTY TANK (W <sub>T</sub> )		
$W_T = (\text{OUTSIDE VOL. DIMENSIONS} - \text{INSIDE VOL. DIMENSIONS}) \times \gamma_{concrete}$		
$W_T =$	11,860 Lb.	
DOWNWARD WEIGHT OF SOIL COVER (W <sub>S</sub> )		
$W_S = \text{DEPTH OF SOIL COVER PROPOSED} \times \text{AREA OF TANK} \times \gamma_{soil}$		
$W_S =$	4,912 Lb.	
SUMMARY		
$W_T + W_S =$	16,772 Lb.	
$F =$	7,000 Lb.	
	0 Additional lbs. of ballast needed	

PROJECT NAME: HANKS	PC (H-10)	PLAN #: L-14172
JOB NUMBER: 32548		DATE: 12/28/2020
<b>BUOYANCY CALCULATIONS</b>		
DESCRIPTION: PUMP DOSING CHAMBER		
TANK MANUFACTURER: SHEA		
ITEM NUMBER: TR-100 (H-10)		
TANK SIZE: 1,000 GAL.		
OUTSIDE DIMENSIONS:	LENGTH = 8.00 R.	ASSUMPTIONS: $\gamma_{water} = 62.4 \text{ lb/ft}^3$
	WIDTH = 5.17 R.	$\gamma_{soil} = 150.0 \text{ lb/ft}^3$
	HEIGHT = 5.67 R.	$\gamma_{soil} = 110.0 \text{ lb/ft}^3$
INSIDE DIMENSIONS:	LENGTH = 7.50 R.	
	WIDTH = 4.67 R.	
	HEIGHT = 5.00 R.	
SEASONAL HIGH GROUNDWATER ELEVATION =	103.3 R.	
TOP OF TANK ELEVATION =	107.4 R.	
BOTTOM OF TANK ELEVATION =	101.7 R.	
DEPTH OF SOIL COVER PROPOSED =	0.75 R.	
UPWARD FORCE OF GROUNDWATER (F)		
$F = PA$		
WHERE:	$P = (\text{GROUNDWATER ELEV.} - \text{BOT. OF TANK ELEV.}) \times \gamma_{water}$	
$A = \text{AREA OF TANK}$		
$F =$	4,568 Lb.	
DOWNWARD WEIGHT OF EMPTY TANK (W <sub>T</sub> )		
$W_T = (\text{OUTSIDE VOL. DIMENSIONS} - \text{INSIDE VOL. DIMENSIONS}) \times \gamma_{concrete}$		
$W_T =$	8,988 Lb.	
DOWNWARD WEIGHT OF SOIL COVER (W <sub>S</sub> )		
$W_S = \text{DEPTH OF SOIL COVER PROPOSED} \times \text{AREA OF TANK} \times \gamma_{soil}$		
$W_S =$	3,412 Lb.	
SUMMARY		
$W_T + W_S =$	12,400 Lb.	
$F =$	4,568 Lb.	
	0 Additional lbs. of ballast needed	

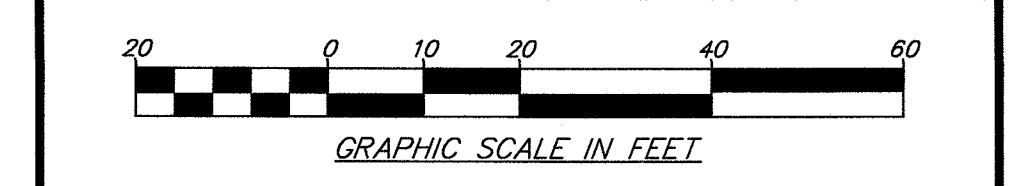


KEY MAP  
1"=100'



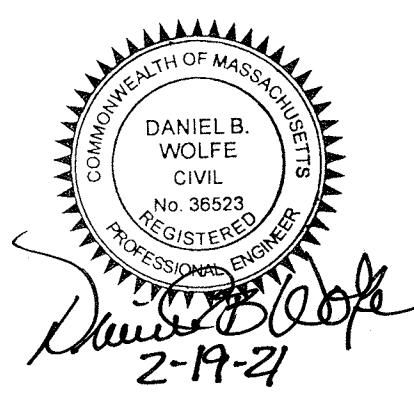
LOCUS MAP  
NOT TO SCALE

LEGEND	
---	EXISTING CONTOUR
- - -	PROPOSED CONTOUR
⊠	PERCOLATION TEST HOLE
⊙	OBSERVATION TEST HOLE
S	SEWER LINE
W	WATER LINE
---	EDGE OF WETLANDS



SURV: SPM/CRH	CALC.: KRC	DRAFT: KRM
NER: 801-30,31	DEED: 686.37-85	CHECK: DBW

REVISIONS	
1/12/20	Original endorsement
2/19/21	Conventional reserve area, inspection port location, top and subsoil removal



SHEET TITLE:  
SEWAGE DISPOSAL SYSTEM

DESIGNED FOR: RICHARD HANKS & KAREN HILL

ADDRESS: 158 WARREN ROAD  
TOWNSEND, MA

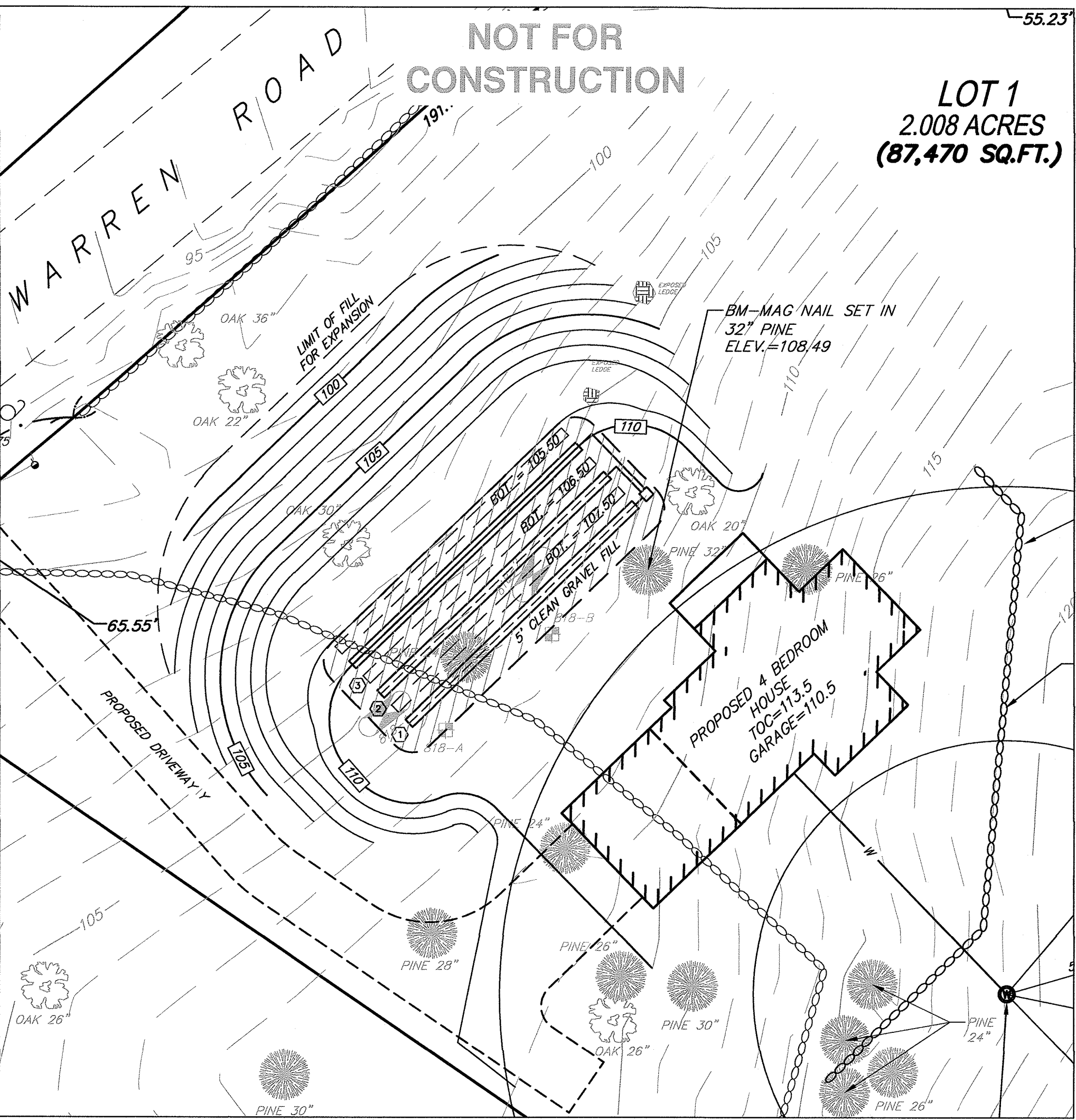
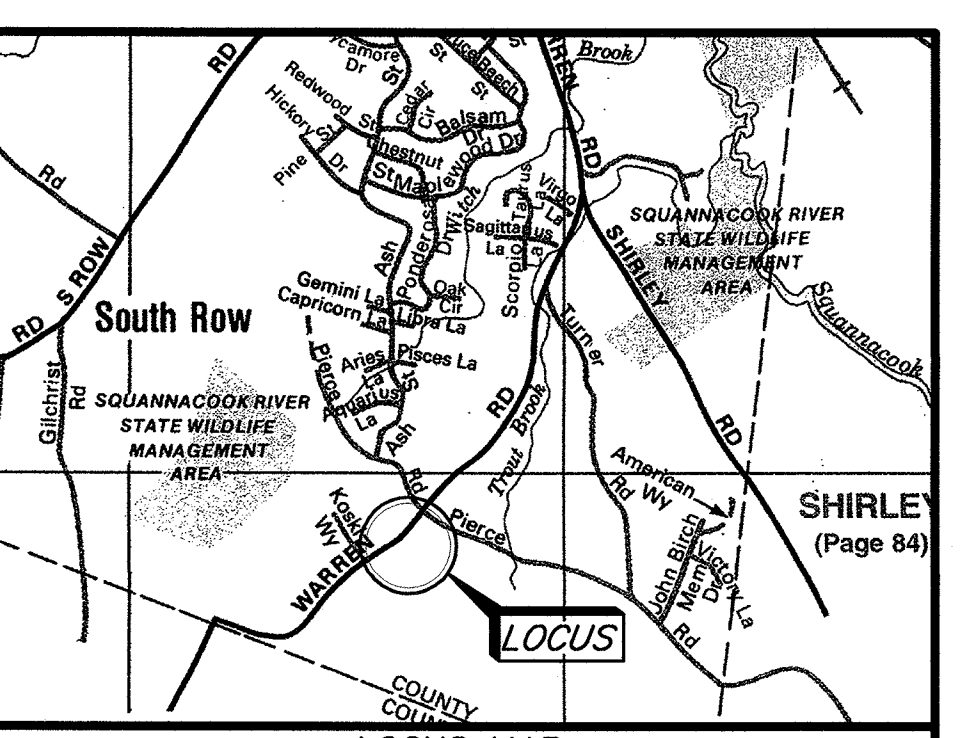
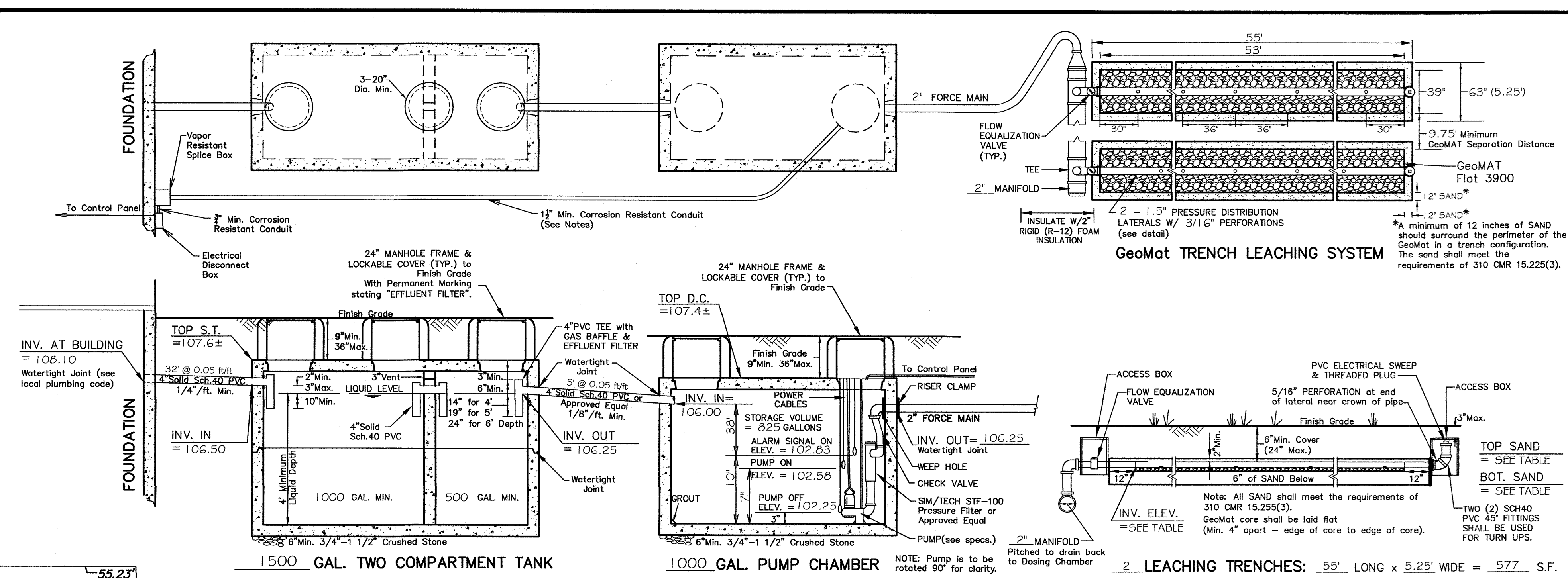
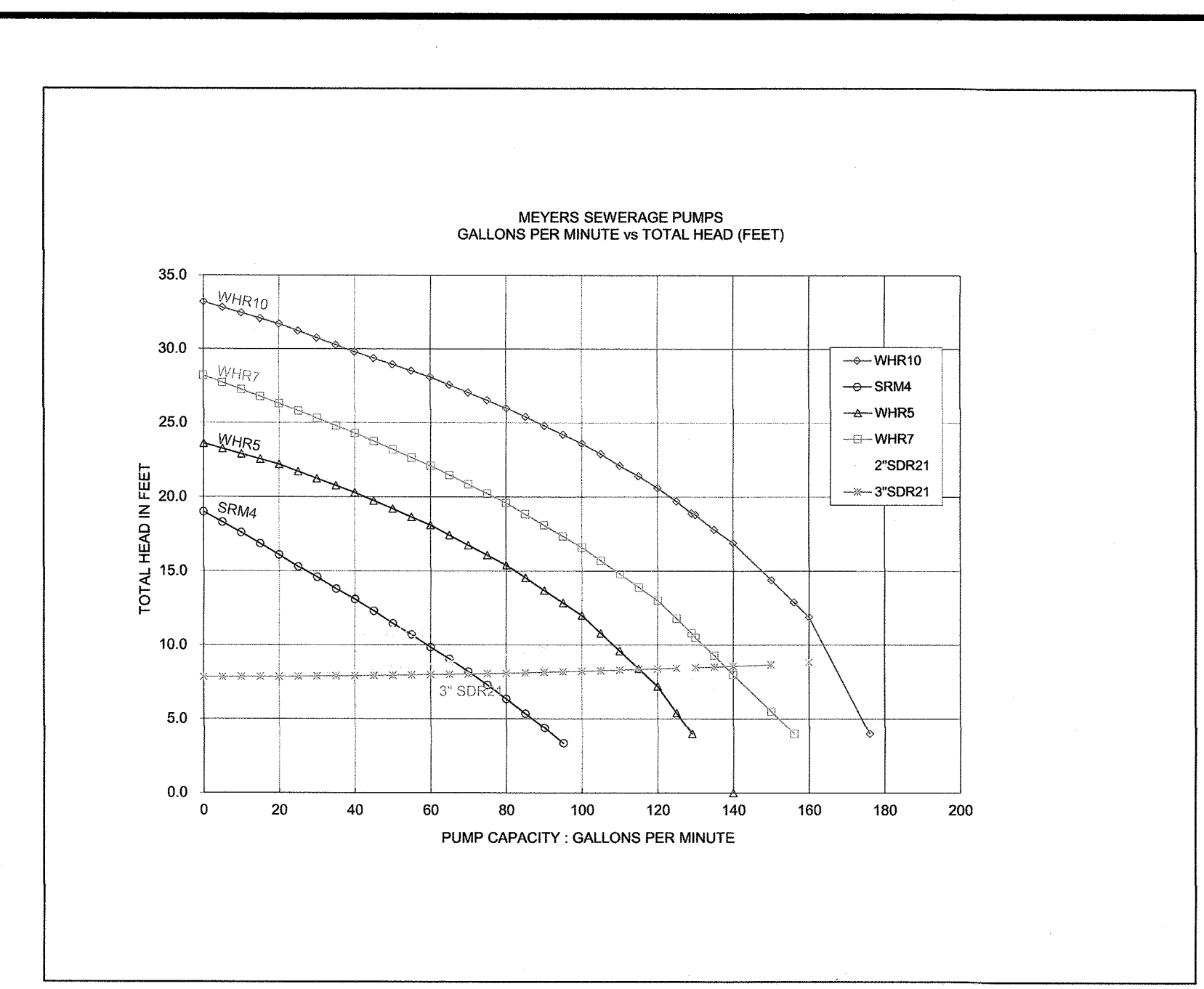
LOT NO.: 1	ASSESSOR MAP: 31	ASSESSOR PARCEL: 21.1
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**DAVID E. ROSS ASSOCIATES, INC.**  
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Harvard, MA 01451-0795  
978-772-6232  
FAX 978-772-8258  
www.davidross.com

SCALE: 1"=20'	DATE: JANUARY 2021
REF: - -	PLAN NO.: L-14172
JOB NO.: 32548	SHEET NO.: 1 of 2

R:\Proj\CH32D\2015\32548\HANKS\32548HANKS - Lot 1 SDS - Rev 2-10-2021.dwg

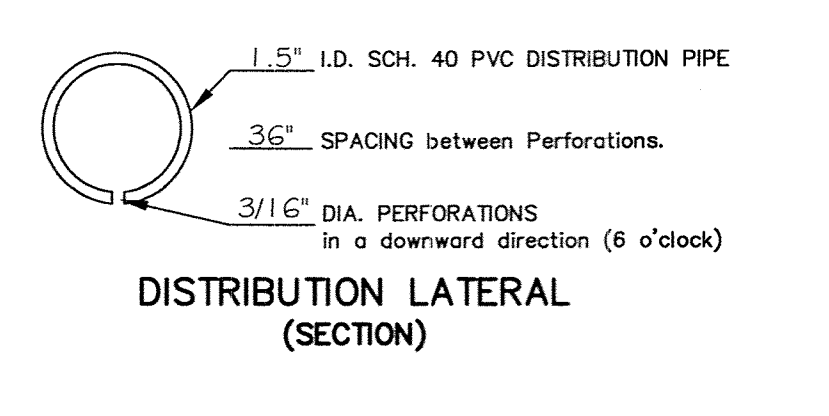




**SEPTIC TANK**  
 SEPTIC TANK SHALL BE A PRECAST, REINFORCED CONCRETE TANK MADE WATER-TIGHT. CONSTRUCTION MATERIALS AND DIMENSIONS SHALL CONFORM TO TITLE 5 AND AASHTO HS 10 REQUIREMENTS AND PLACED ON A STABLE MECHANICALLY COMPACTED LEVEL BASE.  
 TANK / SYSTEM TO BE VENTED THROUGH THE BUILDING PLUMBING SYSTEM AS REQUIRED BY BUILDING CODE.  
 TANK SHOULD BE INSPECTED, MAINTAINED AND BE PUMPED OUT WHEN SLUDGE DEPTH IN THE BOTTOM EXCEEDS ONE FOURTH OF THE TOTAL LIQUID DEPTH.  
 AT LEAST THREE 20" MANHOLES SHALL BE PROVIDED. INLET & OUTLET MANHOLES WITH RISERS AND LOCKABLE COVERS TO FINISH GRADE. ALL OTHERS TO WITHIN 6" OF FINISH GRADE.

**PUMP CHAMBER**  
**GENERAL:** ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO FEDERAL, STATE AND LOCAL CODES, WHETHER SPECIFIED HEREIN OR NOT. ALL PIPING, CONTROLS AND PUMP ARE SUBJECT TO APPROVAL BY THE DESIGN ENGINEER.  
**CHAMBER:** THE CHAMBER SHALL BE A PRECAST, REINFORCED CONCRETE SEPTIC TANK WITH PRE-FITTED BOOTS. CONSTRUCTION MATERIALS AND DIMENSIONS SHALL CONFORM TO TITLE 5 AND AASHTO HS 10 LOADING REQUIREMENTS AND SHALL BE PLACED ON A STABLE MECHANICALLY COMPACTED LEVEL BASE. ONE TANK MANHOLE SHALL EXTEND TO FINISHED GRADE AND BE MADE WATER-TIGHT. COVER SHALL BE METAL AND WEIGH 50 LBS. (MINIMUM) AND HAVE AN INSIDE DIAMETER 1 1/2 TIMES MAXIMUM PUMP DIMENSION AND HAVE A 24" INSIDE DIAMETER MINIMUM. CHAMBER TO BE VENTED VIA BUILDING PLUMBING SYSTEM TO ROOF. IF THE CHAMBER IS TO BE UNDER PAVED SURFACES OR SUBJECT TO VEHICULAR LOADING, THE CHAMBER, ALL MANHOLES AND EXTENSIONS SHALL BE RATED TO WITHSTAND AASHTO HS-20 DIRECT LOADING (HEAVY DUTY).  
**PUMPS:** PUMP SHALL BE A NON-CLOG SUBMERSIBLE SEWAGE PUMP CAPABLE OF PASSING A 1 1/4" DIAMETER SOLID AND STRINGY MATERIAL. PUMPS SHALL HAVE A 1/4 HP (MINIMUM) MOTOR AND SHALL BE CAPABLE OF PUMPING 200 GALLONS PER MINUTE (GPM) AGAINST A TOTAL DYNAMIC HEAD (TDH) OF 9.04 FEET.  
**ENGINEER SPECIFIED PUMP:** MEYERS SRM4 OR EQUIVALENT.  
 PUMP SIZE AND SPECIFICATIONS ARE BASED UPON THE PROPOSED DOSING CHAMBER ELEVATIONS AND LOCATION SHOWN HEREON. ANY ALTERATIONS SHALL BE APPROVED BY THE DESIGN ENGINEER.  
**CONTROLS:** PUMP AND ALARM SHALL BE ACTIVATED BY MECHANICAL FLOAT SWITCHES AS SHOWN. THREE FLOATS ARE REQUIRED. FLOATS AND PUMP POWER CABLE ARE TO BE SUSPENDED FROM AND TIED TO A 1 1/2" DIAMETER, STEEL REBAR WITH HOSE CLAMPS. THE REBAR SHALL BE SECURELY AND PERMANENTLY ANCHORED TO THE SIDES AND/OR THE WALL OF THE CHAMBER.  
 THE INTERIOR OF THE PUMP CHAMBER IS A CORROSIVE ENVIRONMENT AND EXPLOSIVE GASES MAY BE PRESENT. ALL WIRING AND ELECTRICAL EQUIPMENT MUST COMPLY WITH CURRENT ELECTRICAL CODE AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.  
 NO SPICES ARE ALLOWED INSIDE THE PUMP CHAMBER. ELECTRIC LINES ARE TO BE CONTINUOUS FROM THE PUMP AND FLOAT SWITCHES TO A VAPOR PROOF, STRAIN RELIEF SPICE BOX LOCATED OUTSIDE OF THE PUMP CHAMBER. VAPOR PROOF SPICE BOX MAY BE ATTACHED TO THE EXTERIOR OF THE HOUSE OR LOCATED INSIDE AN ELECTRICAL PULL BOX. AN ELECTRICAL DISCONNECT BOX ATTACHED TO THE OUTSIDE OF HOUSE IS REQUIRED.  
 MINIMUM SIZE OF CORROSION RESISTANT CONDUIT FROM PUMP CHAMBER TO SPICE BOX IS 1 1/2". MINIMUM CONDUIT SIZE FROM SPICE BOX TO DISCONNECT BOX IS 3". BOTH ENDS OF ALL CONDUITS ARE TO BE SEALED WITH DUCT SEAL TO PREVENT THE TRANSMISSION OF VAPORS AND GAS.  
 THE DIMENSIONAL SETTINGS OF THE FLOATS (SEE DOSING CHAMBER DETAIL ON THIS SHEET) ARE THE ELEVATIONS AT WHICH THE FLOATS ARE TO ACTIVATE/INACTIVATE THE PUMP AND/OR ALARM. THE FLOAT LEVEL CONTROLS SHALL BE SET TO OPERATE AT THE ELEVATIONS INDICATED. THESE ELEVATIONS SHALL BE ADJUSTED BY THE INSTALLER TO ENSURE FUNCTION ACCORDING TO THESE SPECIFIC ELEVATIONS.  
 THE CONTROL PANEL SHALL BE HOUSED IN A NEMA-1 CONTROL BOX SUITABLE FOR USE WITH ALL OF THE 'COMPONENT MANUFACTURERS' STANDARDS FOR THE EQUIPMENT USED AND SHALL HAVE AN AUDIO ALARM AND VISUAL ALARM WITH A MANUAL SILENCER. THE CONTROL PANEL SHALL BE INSTALLED IN A SUITABLE LOCATION INSIDE OF THE BUILDING. ALARM SHALL BE ON A SEPARATE CIRCUIT FROM THE PUMP. ALL ELECTRICAL WORK SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL BUILDING CODE REQUIREMENTS.  
 FLOW EQUALIZATION VALVES SHALL BE INSTALLED BETWEEN THE MANIFOLD AND THE BEGINNING OF EACH LATERAL TO PROVIDE EQUAL HEAD / FLOW OF EFFLUENT TO ALL ROWS.  
 PIPING: PIPING FROM PUMP TO 3" OUTSIDE TANK SHALL BE 2" SCHEDULE 40 (SDR-21) SOLVENT-WELDED PVC OR ABS. CHECK VALVE SHALL BE 2" BALL-TYPE WITH 2 HOSE CLAMP CONNECTIONS AT EACH SIDE OF THE JOINT. RISER CLAMPS WITH PVC INSERTS ARE REQUIRED AT PUMP CHAMBER. ALL PIPING SHALL BE SHIELDED FROM ANY ABRASION (INCLUDING FORCE MAIN).  
 FORCE MAIN: FORCE MAIN SHALL HAVE 4" MINIMUM COVER EXCEPT WITHIN 5' OF THE CHAMBER AND MANIFOLD WHICH SHALL BE INSULATED WITH 2" RIGID PRE-MOLDED POLYSTYRENE INSULATION. FORCE MAIN SHALL BE 1.5" SDR-21 PVC TIGHT JOINT PIPE. JOINTS SHALL BE SOLVENT-WELDED. TRANSITION BETWEEN DOSING CHAMBER PIPING AND FORCE MAIN SHALL BE WITH A 2" PVC UNION SOCKET. ALL PIPES SHALL BE SET IN 6" OF SAND AND BE SNAKED TO ALLOW FOR CONTRACTION AND BE LAID TO PROVIDE A DOWNWARD GRADIENT FROM THE CHAMBER TO THE MANIFOLD TO THE CHAMBER. ALL JOINTS SHALL BE WATER AND PRESSURE TIGHT WITH NO LEAKAGE ALLOWED. SHALL BE WATER AND PRESSURE TIGHT WITH NO LEAKAGE ALLOWED.  
 A PORTION OR ALL OF THE FORCE MAIN MAY BE PROPOSED TO BE INSTALLED ABOVE THE FROST LINE. THOSE PORTIONS, IN ACCORDANCE WITH TITLE 5 310 CMR 15.225(3) SHALL BE INSULATED ADEQUATELY OR BE MADE SELF DRAINING.

**GENERAL NOTES**  
 SYSTEM IS DESIGNED TO ACCOMMODATE SANITARY SEWAGE ASSOCIATED WITH NORMAL DOMESTIC USE AND CONSISTING OF WATER CARRIED PUTRESCIBLE WASTE ONLY.  
 ALL COMPONENTS OF THE SEWAGE DISPOSAL SYSTEM SHALL BE COVERED BY A MAXIMUM OF 36" OF CLEAN BACKFILL MATERIAL, FREE OF STONES AND BOULDERS GREATER THAN 4" IN SIZE.  
 ALL COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPASS MEANS IN ORDER TO LOCATE THEM ONCE BURIED.  
 OWNER SHALL VERIFY EFFECTIVE ZONING REGULATIONS PRIOR TO CONSTRUCTION.  
 ALL PIPING SHALL BE LAID TRUE TO LINE, GRADE AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.  
 THERE ARE NO EXISTING WELLS WITHIN 100' OF THE PROPOSED SEWAGE DISPOSAL SYSTEM. (50' OF THE SEPTIC TANK). THERE ARE NO EXISTING SEWAGE DISPOSAL SYSTEMS WITHIN 100' FEET OF THE PROPOSED WELL.  
 ALL KNOWN WELLS WITHIN 200' OF THE PROPOSED PRIMARY AND EXPANSION LEACH AREAS ARE SHOWN.  
 THE DESIGN ENGINEER SHALL BE NOTIFIED PROMPTLY OF ANY PLAN DEFICIENCIES FOUND DUE TO UNFORESEEN SUBSURFACE CONDITIONS OR OTHER REASONS THAT MIGHT AFFECT THE FUNCTION OF THIS DESIGNED SYSTEM.  
 DEVIATIONS IN DESIGN OR CONSTRUCTION FROM THIS PLAN OR ANY OF THE CONDITIONS RELATING TO THE USE OR MAINTENANCE OF THE PROPOSED SYSTEM SHALL BE DEEMED TO VOID ANY CERTIFICATION OR REPRESENTATION MADE RELATIVE TO THIS SUBSURFACE SEWAGE DISPOSAL SYSTEM.  
 CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY EXCAVATION. 1-888-DIG-SAFE (344-7233)  
 PRIOR TO ANY CONSTRUCTION A BENCHMARK SHALL BE SET WITHIN 50'-75' OF THE PROPOSED SEWAGE DISPOSAL SYSTEM.  
**SYSTEM IN FILL**  REQUIRED  NOT REQUIRED  
 IF ANY PORTION OF THE PROPOSED LEACHING AREA IS LOCATED ABOVE EXISTING GRADE OR WITHIN TOPSOIL, PEAT OR OTHER UNSUITABLE OR IMPERVIOUS SOIL LAYER, THEN THE PLACEMENT OF FILL IS REQUIRED. PRIOR TO THE PLACEMENT OF FILL, ALL UNSUITABLE OR IMPERVIOUS SOILS SHALL BE EXCAVATED TO A MINIMUM OF FIVE FEET LATERALLY IN ALL DIRECTIONS BEYOND THE OUTER PERIMETER OF THE SOIL ABSORPTION SYSTEM TO THE DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL. FILL MATERIAL SHALL BE SELECT, ON-SITE OR IMPORTED SOIL, CONSISTING OF CLEAN GRANULAR SAND, FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. MIXTURES AND LAYERS OF DIFFERENT SOIL CLASSES SHALL NOT BE USED. THE FILL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN 2 INCHES. A SIEVE ANALYSIS USING A #4 SIEVE, SHALL BE PERFORMED ON A REPRESENTATIVE SAMPLE OF THE FILL. UP TO 45% BY WEIGHT OF THE FILL SAMPLE MAY BE RETAINED IN THE #4 SIEVE. ANALYSES SHALL ALSO BE PERFORMED ON THE FRACTION OF FILL SAMPLE PASSING THE #4 SIEVE. SUCH ANALYSES MUST DEMONSTRATE THAT THE MATERIAL MEETS EACH OF THE FOLLOWING SPECIFICATIONS:



SCHEDULE OF ELEVATIONS	PROPOSED	AS-BUILT
TOP CONCRETE FOUNDATION	113.50	
INVERT AT FOUNDATION	108.10	
INVERT TANK INLET	106.50	
INVERT TANK OUTLET	106.25	
TOP SEPTIC TANK	107.6±	
INVERT DOSING CHAMBER INLET	106.00	
INVERT DOSING CHAMBER OUTLET	106.25	
TOP DOSING CHAMBER	107.4±	
GROUNDWATER OFFSET REQUIRED	4'	
GROUNDWATER OFFSET UTILIZED	4'	

LEACHING TRENCH ELEVATIONS				
LINE NUMBER	TOP OF SAND	LATERAL INV. ELEV.	BOTTOM OF GeoMAT	BOTTOM OF SAND
1	108.25	108.08	108.00	107.50
2	107.00	106.83	106.75	106.25

DESIGN CRITERIA				
GARBAGE GRINDERS - NOT PERMITTED				
PERC. TESTS: PERFORMED BY NEIL GORMAN, D.E.R.A., INC. WITNESSED BY RICK METCALF, N.A.B.H.				
PERC. #	RATE (M/L)	ELEVATION	DEPTH	DATE
818-A	5	106.2	50"	8/31/18
818-B	3	106.3	53"	8/31/18

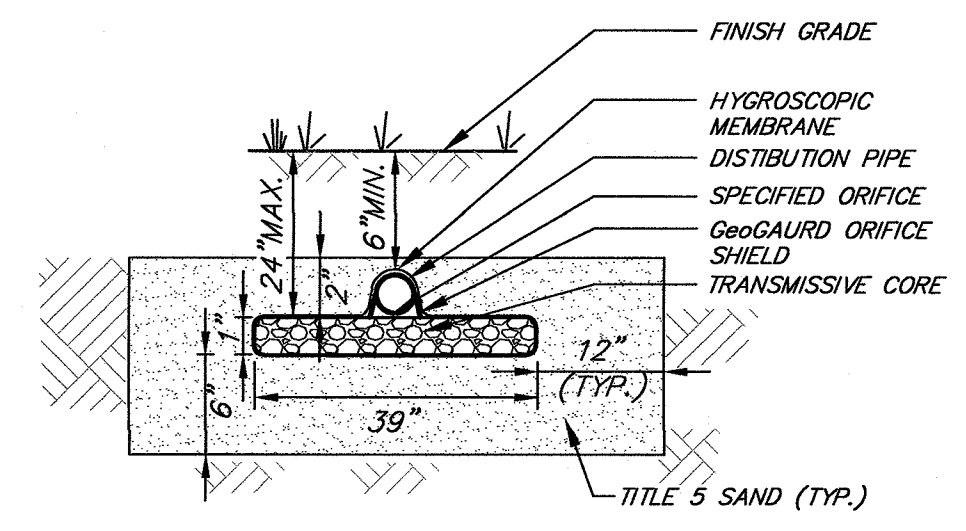
**FLOWS:** 4 BEDROOMS AT 110 GPD = 440 GPD (330 GPD MIN.)  
**SEPTIC TANK REQUIRED:** (1500 GAL. MIN.)  
 440 GPD X 2.0 = 880 GAL. TANK

**LEACHING AREA PROVIDED:**  
 A. BASIS 5 MIN./IN. PERCOLATION RATE  
 B. SOIL CLASS II  
 C. SQUARE FOOTAGE OF GeoMat : 3900 FLAT  
 1. LOADING RATE 1.22 GPD/S.F.  
 INSTALLED IN:  6" SAND BENEATH  NATIVE SOILS  
 2. GeoMat AREA REQUIRED:  
 440 GPD / 1.22 GPD/S.F. = 361 S.F.  
 3. LENGTH OF GeoMat REQUIRED:  
 361 S.F. / 3.42 S.F./L.F. = 106 L.F.  
 4. LENGTH OF GeoMat PROVIDED:  
 2 TRENCHES X 53' L.F./TRENCH = 106 L.F.  
 5. EFFECTIVE LEACHING AREA PROVIDED:  
 2 TRENCHES (55' L X 5.25' W) = 577 S.F. (INCLUDES 12" OF SAND AROUND EACH GeoMat) 440 S.F. (MIN.)

**DESIGN CRITERIA**  
 GARBAGE GRINDERS - NOT PERMITTED  
**FLOWS:** 4 BEDROOMS AT 110 GPD = 440 GPD (330 GPD MIN.)  
**SEPTIC TANK REQUIRED:** (1500 GAL. MIN.)  
 440 GPD X 2.0 = 880 GAL. TANK  
**LEACHING AREA PROVIDED:**  
 A. BASIS 5 MIN./IN. PERCOLATION RATE  
 B. SIDEWALL AREA PROVIDED 372 S.F.  
 372 S.F. X 0.60 GPD/SF = 223 GPD  
 C. BOTTOM AREA PROVIDED = 372 S.F.  
 372 S.F. X 0.60 GPD/SF = 223 GPD  
 D. TOTAL G.P.D. PROVIDED 446  
 E. TOTAL SF. PROVIDED 744

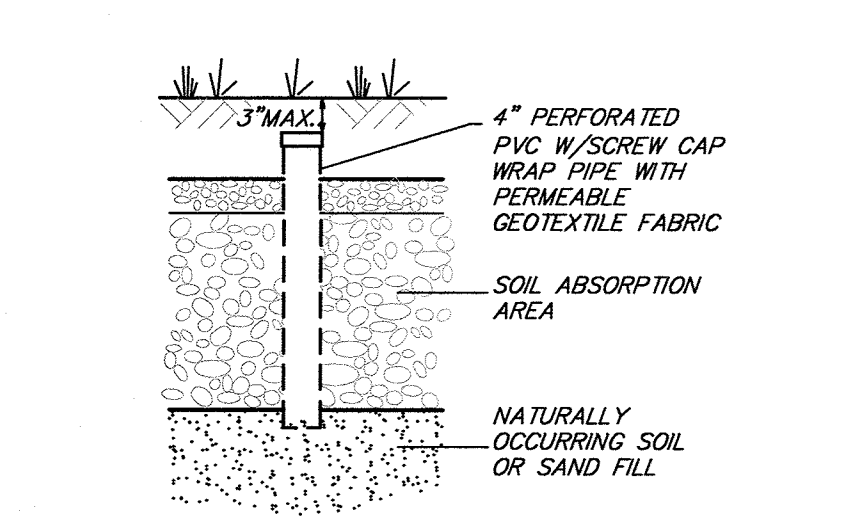
TRADITIONAL PRIMARY TRENCH ELEVATION SCHEDULE				
3 TRENCHES 62L x 2W x 1D = 744 S.F.				
TRENCH NUMBER	TOP STONE	HIGH INV. ELEV.	LOW INV. ELEV.	BOTTOM STONE
1	109.81	109.31	109.00	108.00
2	108.81	108.31	108.00	107.00
3	107.81	107.31	107.00	106.00

FUTURE EXPANSION: 3 TRENCHES 62L x 2W x 1D = 744 S.F. (BOTTOM ELEVATIONS SHOWN IN PLAN VIEW ABOVE)



**GeoMat Leaching System (Pressure Dosed - Cross Section)**  
 NOT TO SCALE

**WETLAND PROTECTION ACT (C131 S40)**  
 PRIOR TO INITIATING ANY ALTERATIONS (REMOVAL OF VEGETATION, EXCAVATIONS, GRADING, ETC.) WITHIN 100' OF WETLANDS (PONDS, BROOKS, SWAMPS, ETC.) OR WITHIN 200' OF AN AREA SUBJECT TO THE RIVER'S ACT (PERENNIALY FLOWING RIVER, BROOK OR STREAM), A REQUEST FOR DETERMINATION OF APPLICABILITY OR A NOTICE OF INTENT UNDER THE WETLANDS PROTECTION ACT (310 CMR 10.00) SHOULD BE FILED WITH THE TOWN'S CONSERVATION COMMISSION. LOCAL BYLAWS MAY ALSO APPLY.



**INSPECTION PORT**  
 NOT TO SCALE

NOTES  
 GARBAGE DISPOSALS AND WATER SOFTENERS SHALL NOT BE USED WITH THE GeoMAT LEACHING SYSTEM.  
 GeoMAT LEACHING SYSTEM DESIGNED IN ACCORDANCE WITH GENERAL USE APPROVAL ISSUED TO GEOMATRIX SYSTEMS, LLC, JANUARY 11, 2017, MODIFIED MARCH 13, 2017, LAST MODIFIED JULY 14, 2017, TRANSMITTAL #W267826, AND THE STANDARD CONDITIONS FOR ALTERNATIVE SOIL ABSORPTION SYSTEMS, DATED MARCH 5, 2016.

OBSERVATION TEST HOLE DATA BY NEIL GORMAN, D.E.R.A., INC. WITNESSED BY RICK METCALF, N.A.B.H. 8/31/18  
 818-1: ELEV. = 105.2'  
 Ap 0' - 4" SANDY LOAM  
 Bw 4' - 22" SANDY LOAM  
 C 22' - 112" GRAVELLY SANDY LOAM W/ LENSES OF LOAMY SAND  
 MOTTLING AT 36"  
 GROUNDWATER OBSERVED AT 108"  
 NO REFUSAL  
 E.S.H.W.T. AT 36" (102.2)  
 818-2: ELEV. = 105.2'  
 Ap 0' - 4" SANDY LOAM  
 Bw 4' - 24" SANDY LOAM  
 C 24' - 108" GRAVELLY SANDY LOAM  
 MOTTLING AT 42"  
 GROUNDWATER OBSERVED  
 NO REFUSAL  
 E.S.H.W.T. AT 42" (101.7)

REVISIONS  
 1/12/20 Original endorsement  
 2/19/21 Two compartment tank, tank risers, conventional system reserve area, minimum cover increased, flow equalization valve box, pump curve, top of sand elevation

**SEWAGE DISPOSAL SYSTEM**  
 DESIGNED FOR: RICHARD HANKS & KAREN HILL  
 ADDRESS: 158 WARREN ROAD TOWNSEND, MA  
 LOT NO.: 1 ASSESSOR MAP: 31 ASSESSOR PARCEL: 21.1

**DAVID E. ROSS ASSOCIATES, INC.**  
 CIVIL ENGINEERS - LAND SURVEYORS ENVIRONMENTAL CONSULTANTS  
 6 Lancaster County Road P.O. Box 795 Harvard, MA 01451-0795  
 978-772-6232 FAX 978-772-6258 www.davidross.com  
 SCALE: 1"=20' DATE: JANUARY 2021  
 REF.: -- PLAN NO.: L-14172  
 JOB NO.: 32548 SHEET NO.: 2 of 2