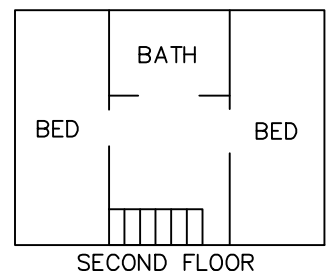
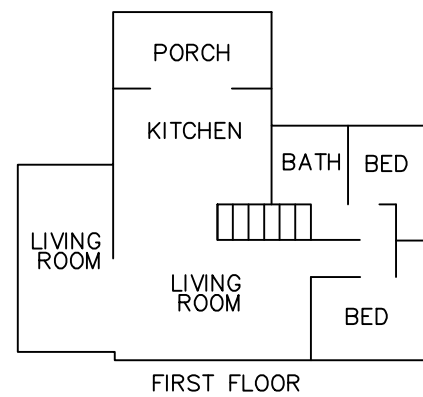


VICINITY MAP
NO SCALE

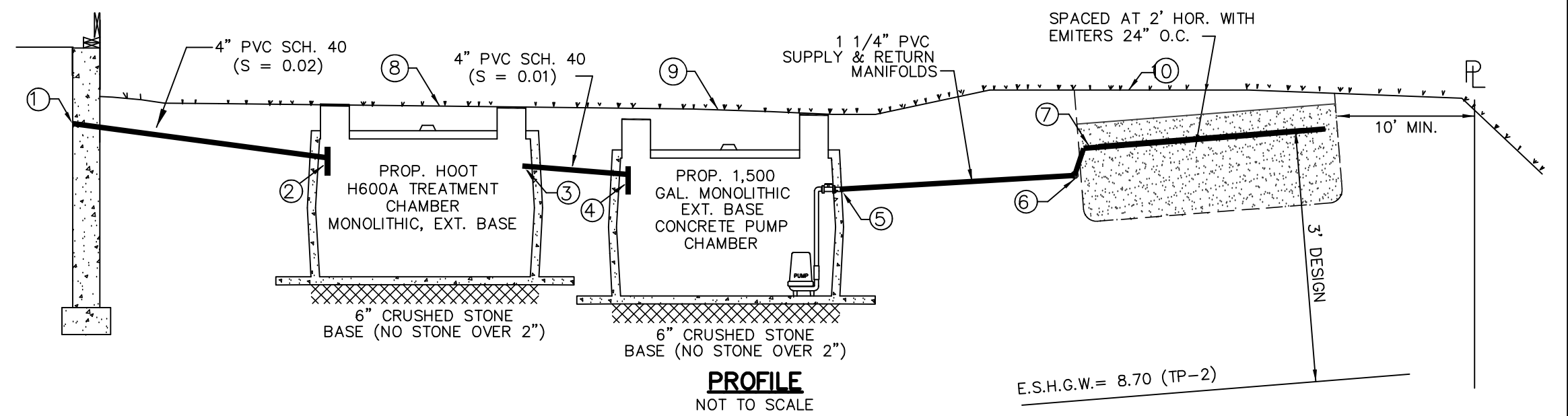
SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: PAUL GUNN, SE#14392
SOIL TESTING WITNESSED BY: PETER FALABELLA
DATE: FEBRUARY 21, 2020

TP-1	APPROX. GRADE	EL. 9.7	TP-2	APPROX. GRADE	EL. 12.5
	A HORIZON SANDY LOAM 10YR 4/3	14"		A HORIZON SANDY LOAM 10YR 4/3	12"
EL. 8.5	B HORIZON SANDY LOAM 10YR 5/6				
EL. 6.2	C1 HORIZON SANDY LOAM 2.5Y 4/2	42"	EL. 10.4	B HORIZON SANDY LOAM 10YR 5/6	25"
EL. 1.2		102"	EL. 8.3	C1 HORIZON SANDY LOAM 2.5Y 4/2	50"
WEEPING OBSERVED: 82" (EL. 2.9)			EL. 2.4	C2 HORIZON LOAMY SAND 2.5Y 4/1	120"
MOTTLING OBSERVED: NONE			WEEPING OBSERVED: 58" (EL. 7.7)		
PERC. RATE: NONE			MOTTLING OBSERVED: 46" (EL. 8.7)		
ESHW: 82" (EL. 2.9)			PERC. RATE: SIEVE @ 68"		
			ESHW: 46" (EL. 8.7)		



SCHEMATIC FLOOR PLAN
NOT TO SCALE



SCHEDULE OF ELEVATIONS

1. INV. OF PIPE AT FOUNDATION = 12.2± (CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION)	6. INV. OF PIPE AT 1 1/4" SUPPLY & RETURN MANIFOLD (START) = 6.34
2. INV. OF PIPE AT HOOT TANK INLET = 7.25	6. INV. OF PIPE AT 1 1/4" SUPPLY & RETURN MANIFOLD (END) = 11.20
3. INV. OF PIPE AT HOOT TANK OUTLET = 7.00	7. INV. OF GEO-FLOW DRIP PIPING = TUBE 1 (11.70) - TUBE 18 (6.84)
4. INV. OF PIPE AT PUMP CHAMBER INLET = 5.00	8. FINISHED GRADE OVER HOOT TANK = 9.0 (MIN.) - 11.3 (MAX.)
5. INV. OF PIPE AT PUMP CHAMBER OUTLET = 5.25	9. FINISHED GRADE OVER PUMP CHAMBER = 7.0 (MIN.) - 9.3 (MAX.)
	10. FINISHED GRADE GEO-FLOW PIPING = MATCH EXISTING, SEE CROSS SECTION

GENERAL NOTES

- SEPTIC SYSTEM INSTALLATION CONTRACTORS SHALL BE LICENSED BY THE BOARD OF HEALTH AND MUST COMPLY WITH ALL REQUIREMENTS OF THE BOARD OF HEALTH DISPOSAL WORKS CONSTRUCTION PERMIT AND ANY CONDITIONS, IF ISSUED BY THE CONSERVATION COMMISSION.
- ALL CONSTRUCTION MUST COMPLY WITH TITLE 5 OF THE STATE ENVIRONMENTAL CODE 310 CMR 15 & THE ANY LOCAL BOARD OF HEALTH SUPPLEMENTAL REGULATIONS.
- THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE BOARD OF HEALTH AND DESIGN ENGINEER.
- ANY CHANGE IN SITE CONDITIONS, DISCREPANCIES, ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF MORSE ENGINEERING PRIOR TO THE COMMENCEMENT OF WORK.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH TITLE 5 (310 CMR 15) AND THE LOCAL BOARD OF HEALTH REQUIREMENTS TO THE FULLEST EXTENT PRACTICABLE. NO GUARANTEE TO THE SYSTEMS PERFORMANCE IS EXPRESSED OR IMPLIED.
- SOIL TEST DATA SHOWN IS LIMITED TO THE CONDITIONS EXISTING AT THE SUBJECT TEST PIT LOCATION ONLY. IF DIFFERENT SOIL CONDITIONS ARE FOUND IN THE AREA OF THE PROPOSED SOIL ABSORPTION SYSTEM THEY SHALL BE BROUGHT TO THE ATTENTION OF MORSE ENGINEERING IMMEDIATELY.
- THE CONTRACTOR SHALL NOTIFY DIGSAFE PRIOR TO ANY EXCAVATION AT THE SUBJECT PROPERTY. IT IS SPECIFICALLY CAUTIONED THAT THE SUBSURFACE UTILITIES SHOWN ARE APPROXIMATE ONLY AND HAVE BEEN COMPILED FROM AVAILABLE RECORDS AND OBSERVABLE SITE FEATURES. UTILITIES OTHER THAN THOSE SHOWN MAY BE PRESENT AT THIS LOCATION.
- THIS PLAN HAS BEEN PREPARED SPECIFICALLY AS A SEPTIC SYSTEM DESIGN AND IS NOT TO BE USED TO ESTABLISH PROPERTY LINES OR BUILDING SETBACKS. PROPERTY LINES AND BUILDING LOCATIONS ARE GRAPHIC ONLY. PROPERTY LINES NOT HAVING BEEN VERIFIED. NO REPRESENTATION OR CERTIFICATION AS TO THE ACCURACY OF THOSE SHOWN IS IMPLIED.
- CONTRACTOR TO VERIFY AND ENSURE THAT ALL INTERIOR PLUMBING IS DIRECTED INTO PROPOSED SEPTIC SYSTEM. ANY VARIATIONS FROM THE DESIGN AS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER.

CONSTRUCTION NOTES

- CONTRACTOR SHALL COORDINATE INSPECTION TIMES WITH THE LOCAL BOARD OF HEALTH AND DESIGN ENGINEER 24-HOURS IN ADVANCE OF THE FOLLOWING INSPECTIONS:
 - AFTER EXCAVATION OF ALL UNSUITABLE MATERIAL FROM SOIL ABSORPTION AREA.
 - PRIOR TO COVERING THE CONSTRUCTED SYSTEM.
 - AFTER SYSTEM BACKFILL AND FINAL GRADING.
- ALL CONSTRUCTION MUST COMPLY WITH TITLE 5 OF THE STATE ENVIRONMENTAL CODE 310 CMR 15 & THE ANY LOCAL BOARD OF HEALTH SUPPLEMENTAL REGULATIONS.
- ALL TIGHT-JOINT PLUMBING SHALL BE CONSTRUCTED OF SCH. 40 PVC PIPE WITH CLEANED AND CEMENTED FITTINGS, UNLESS OTHERWISE NOTED.
- ALL PRECAST/PIPE CONSTRUCTION JOINTS AND FITTINGS SHALL BE MADE WATERTIGHT BY PARING WITH HYDRAULIC CEMENT.
- THE CONTRACTOR SHALL PROVIDE A SIEVE ANALYSIS OF THE TITLE 5 PERC SAND UTILIZED FOR FILL TO VERIFY THAT IT MEETS THE REQUIREMENTS OF 310 CMR 15.255(3). TITLE 5 SAND FILL SHALL COMPLY WITH THE FOLLOWING:

SIEVE SIZE	PARTICLE SIZE
#4	4.75 mm
#50	0.30 mm
#100	0.15 mm
#200	0.075 mm
- THE CONTRACTOR SHALL PREVENT ANY HEAVY CONSTRUCTION MACHINERY AND/OR TRUCKS FROM DRIVING OVER THE PROPOSED SOIL ABSORPTION SYSTEM LOCATION UNTIL FINISHED GRADE IS ESTABLISHED.
- THE CONTRACTOR SHALL INSTALL MAGNETIC TAPE OVER SYSTEM PIPING & COMPONENTS
- THE DESIGN ENGINEER SHALL CERTIFY AND PREPARE AN "AS-BUILT" PLAN FOR SUBMITTAL TO THE BOARD OF HEALTH UPON SEPTIC SYSTEM COMPLETION.
- ALL DISTURBED AREAS SHALL BE RESTORED WITH 4" LOAM & SEED POST CONSTRUCTION.
- ALL SEPTIC SYSTEM COMPONENTS TO BE STAKED OUT BY PROFESSIONAL LAND SURVEYOR PRIOR TO SYSTEM INSTALLATION.
- CONTRACTOR SHALL ABANDON EXISTING SEPTIC COMPONENTS IN ACCORDANCE WITH 310 CMR SEC. 15.354 OF TITLE 5 AND LOCAL REGULATIONS BY PUMPING DRY, CRUSHING AND ABANDONING

SITE NOTES

- LOCUS DOES NOT LIE WITHIN A DEP DESIGNATED ZONE II RESOURCE AREA.
- ALL WETLANDS WITHIN 100 FEET OF THE PROPOSED SEWAGE SYSTEM ARE SHOWN.
- PROPERTY LINE DATA WAS OBTAINED FROM RECORDED DEED (BK. 2860 PG. 369) AND RECORDED PLANS ON FILE AT THE PLYMOUTH COUNTY REGISTRY OF DEEDS.
- THERE WERE NO ACTIVE/POTABLE WELLS OBSERVED WITHIN 100' OF THE PROPOSED SYSTEM.
- LOCUS LIES IN FEMA ZONE "X" & "AE15" AS SHOWN ON FEMA COMMUNITY MAP PANEL 25023C 0107K DATED NOVEMBER 4, 2016. ZONE "AE15" IS DESCRIBED AS A SPECIAL FLOOD HAZARD AREA WITH A BASE FLOOD ELEVATION OF EL. 15.

DESIGN DATA

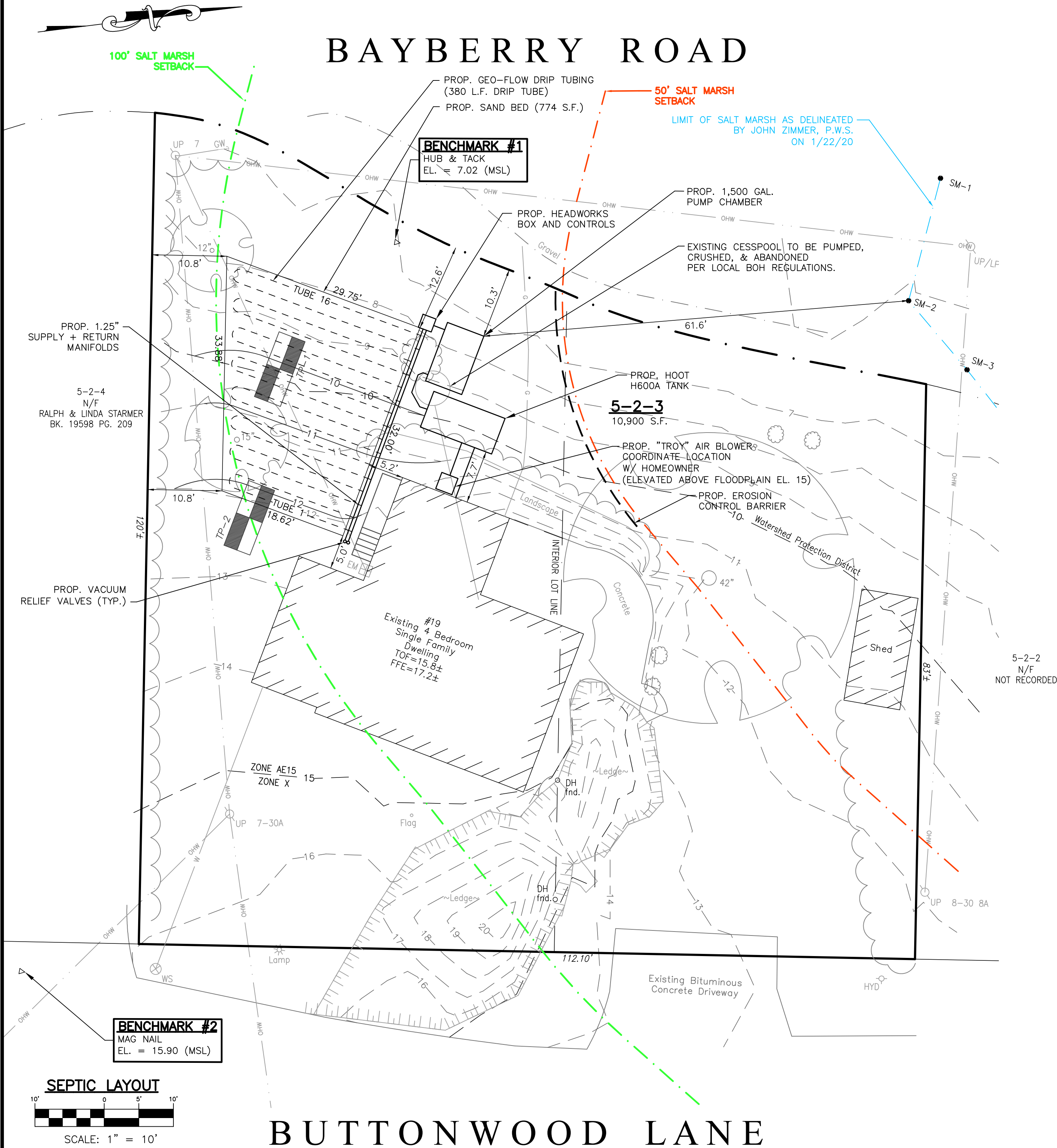
- BUILDING TYPE: SINGLE FAMILY DWELLING
- NO. OF BEDROOMS: 4
- DESIGN FLOW: 4 x 110 GPD/BEDROOM = 440 GPD (GALLONS PER DAY)
- DESIGN PERCOLATION RATE: SIEVE @ 68" (CLASS II, NON-COMPACT)
- GARBAGE DISPOSAL: NO
- SEPTIC TANK DESIGN REQUIREMENT: 200% DESIGN FLOW
440 X 2 = 880 GAL. (PROVIDE NEW H600A HOOT TANK)
- LEACH AREA REQUIREMENTS GALLONS/SQ. FT.
BOTTOM: 0.33 GAL./S.F. SIDE: 0.33 GAL./S.F.
- TOTAL LEACH AREA REQUIRED:
TITLE 5: 440 GPD / (0.33 GPD/S.F.) = 1,333 S.F.
50% SIZE REDUCTION ALLOWED BY HOOT TANK = 1,333 S.F. x 50% = 667 S.F. (MIN.)
PROVIDED: 774 S.F. SAND BED WITH 386 L.F. OF GEOFLOW DRIP TUBING
CAPACITY = 440 GPD
*EFFECTIVE AREA PER GENERAL USE CERTIFICATION ISSUED BY DEP

I/A TECHNOLOGY CREDIT

- TO ALLOW A 50% SIZE REDUCTION FOR THE SOIL ABSORPTION SYSTEM.
- TO ALLOW A MINIMUM OF 2" SEPERATION BETWEEN GROUNDWATER & DRIP TUBING.

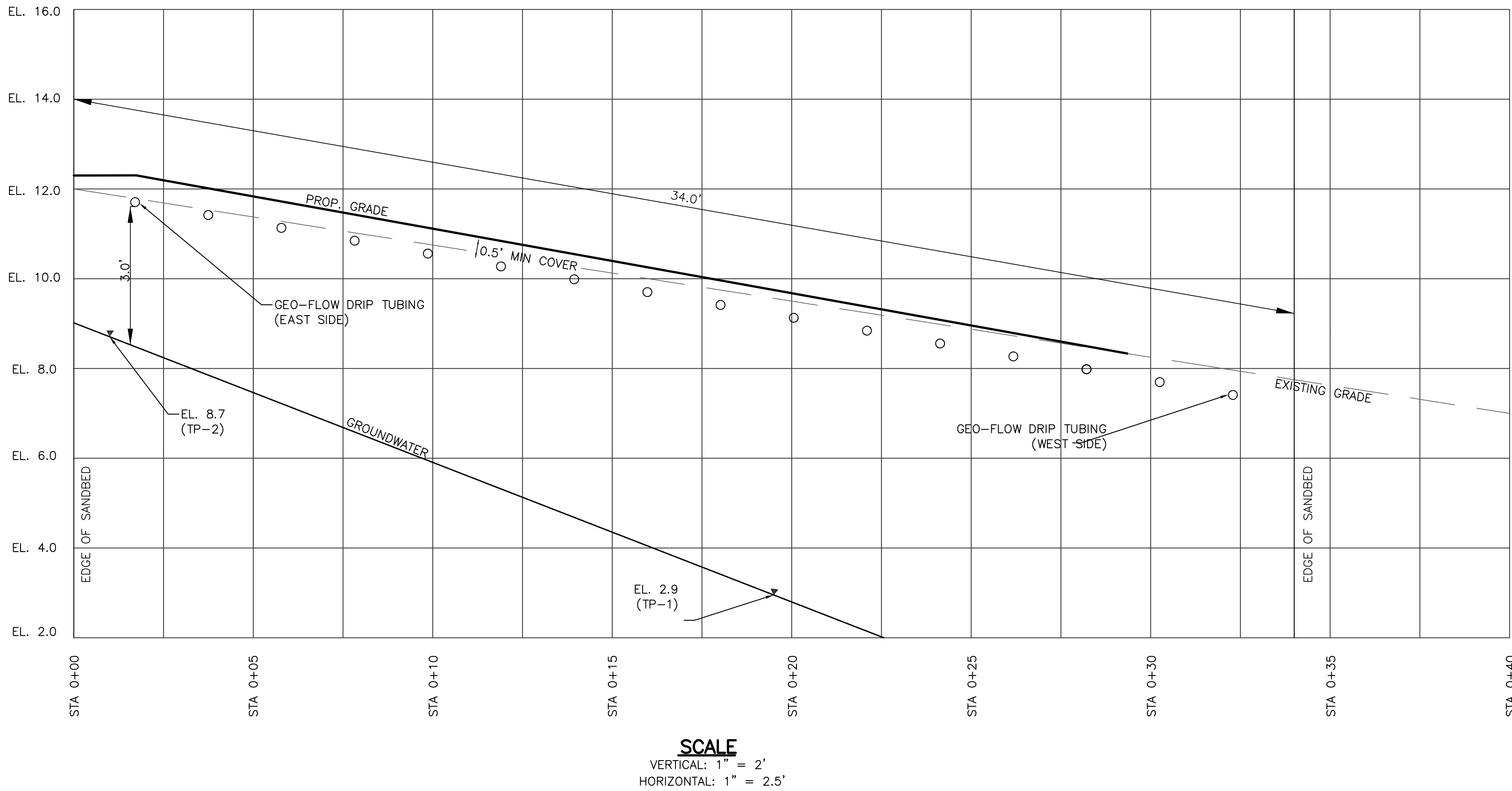
LOCAL UPGRADE APPROVAL REQUESTS

- 310 CMR 15.405(d): TO ALLOW A SIEVE ANALYSIS TO BE PERFORMED.
310 CMR 15.405(b): TO ALLOW A REDUCTION FROM 10' (REQ'D) TO 7.7' (PROP.) BETWEEN THE CELLAR WALL AND THE SEPTIC TANK.

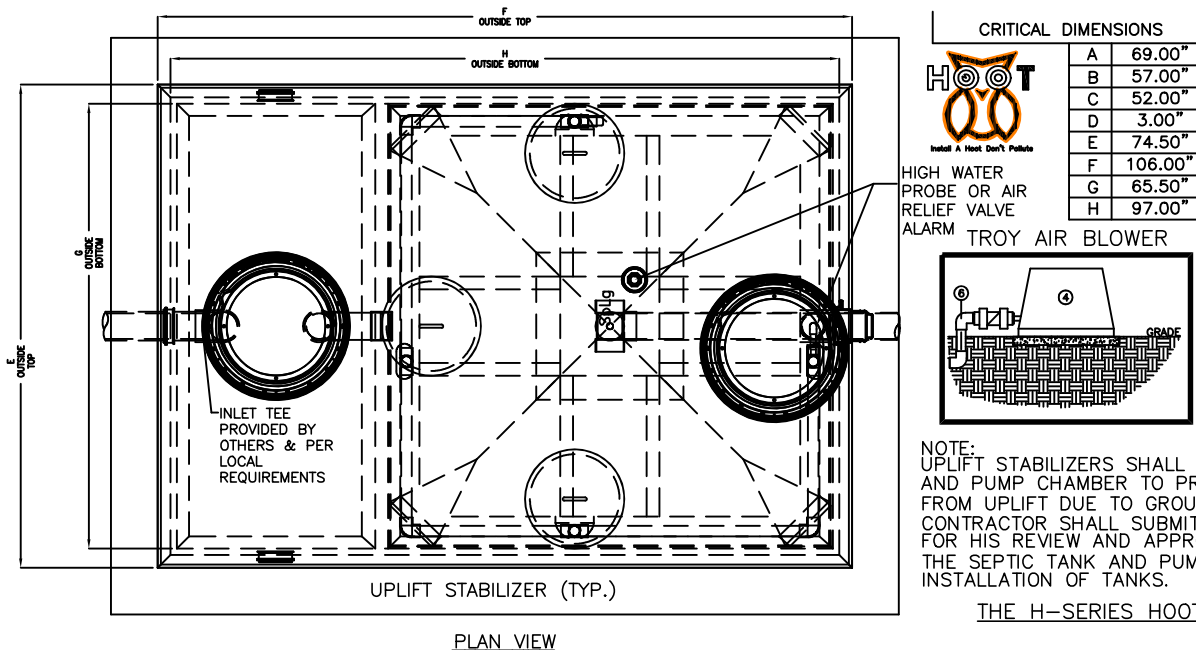


PROJECT: SEPTIC SYSTEM DESIGN PLAN 19 BUTTONWOOD LANE ASSESSOR'S PARCEL: 5-2-3 SCITUATE, MASSACHUSETTS		DESIGN: CRM CHECK: GJM JOB NO: 20-119	
APPLICANT: RICHARD MCQUADE 19 BUTTONWOOD LANE SCITUATE, MASSACHUSETTS 02066		DATE: 3/9/20 REV:	
PLAN TITLE: SEPTIC SYSTEM DESIGN PLAN		SHEET: 1 OF 2	

CONTRACTOR TO BE HOOT/GEOFLOW CERTIFIED
DEED RESTRICTION REQUIRED
OPERATION & MAINTENANCE CONTRACT REQUIRED



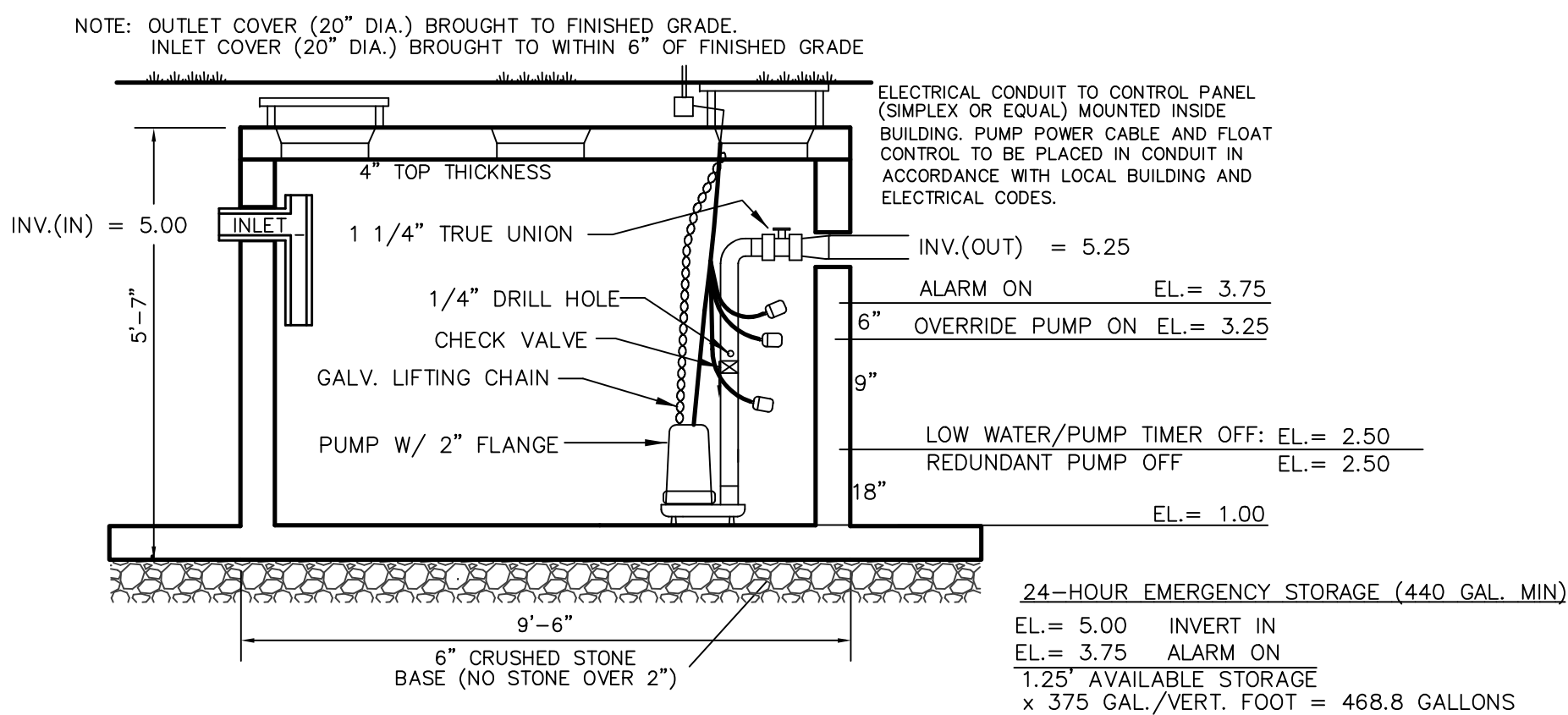
GEOFLOW DRIP TUBING CROSS SECTIONS & ELEVATIONS



HOOT H600A TREATMENT TANK

- CONTACT WIGGIN PRECAST (1-508-564-6776) FOR INSTALLER CERTIFICATION, MANUFACTURING & INSTALLATION REQUIREMENTS.
- INLET AND OUTLET TANK/PIPE CONNECTIONS SHALL BE MADE WATERTIGHT.
- HOOT TANK SHALL BE MONOLITHICALLY CONSTRUCTED & EQUIPPED WITH EXTENDED BASE AND WATERPROOFING.
- HOOT TANK SHALL BE EQUIPPED WITH BOLT DOWN COVERS.

1,500 GAL. MONOLITHIC PUMP CHAMBER (EXT. BASE) DETAIL



PUMP DESIGN NOTES:

- USE SUBMERSIBLE EFFLUENT PUMP: ORENCO PF1005 (1/2 HP) OR APPROVED EQUAL CAPABLE OF ATTAINING: TDH=63.4 FT. @ 4.1 GPM. CONTRACTOR TO PROVIDE ENGINEER WITH PUMP SELECTION SPEC SHEET PRIOR TO INSTALLATION.
- INSTALL HIGH AND LOW WATER MERCURY FLOATS IN PUMP CHAMBER AND ROUTE TO CONTROL PANEL WITH VISIBLE FLASHING AND AUDIBLE ALARMS. PUMP LOCATION TO BE ON EXTERIOR OF BUILDING. COORDINATE LOCATION WITH HOMEOWNER. PUMP POWER SHALL BE LOCATED ON SEPARATE INDEPENDENT CIRCUIT FROM THE ALARM CIRCUIT. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN.
- PUMP CHAMBER IS TO BE DESIGNED FOR H-10 LOADING.
- PUMP CHAMBER SHALL BE MONOLITHICALLY CONSTRUCTED & EQUIPPED WITH EXTENDED BASE AND WATERPROOFING.
- PUMP CHAMBER SHALL BE EQUIPPED WITH BOLT DOWN COVERS.

PUMP DOSING CALCULATIONS

1. DETERMINE VOLUME OF EFFLUENT TO BE PUMPED TO WASTEFLOW DRIPLINE

DAILY FLOW = 440 GALLONS
NUMBER OF DOSES PER DAY = 12
NUMBER OF GALLONS PER DOSE = 440/12 = 36.7 GAL.
DRAIN BACK VOLUME
1 1/4" DELIVERY LINE
 $T(R)^2 = \pi (.052)^2 \times 38.0' = 0.32 \text{ CF} \times 7.48 \text{ G/SF} = 2.41 \text{ GAL.}$
PUMPING VOLUME = DOSING VOLUME + DRAIN BACK VOLUME
39.11 GALS = 36.7 GAL. + 2.41 GAL.

2. FLOW RATE INTO SOIL

LENGTH OF WASTEFLOW DRIPLINE = 386 FEET
NUMBER OF EMITTERS = 193
EMITTERS FLOW RATE = 1.16 GPH FROM GEOFLOW
TOTAL FLOW RATE = 193 x 1.16 = 223.9 GPH/60 MIN. = 3.7 GPM

3. DOSAGE TIME

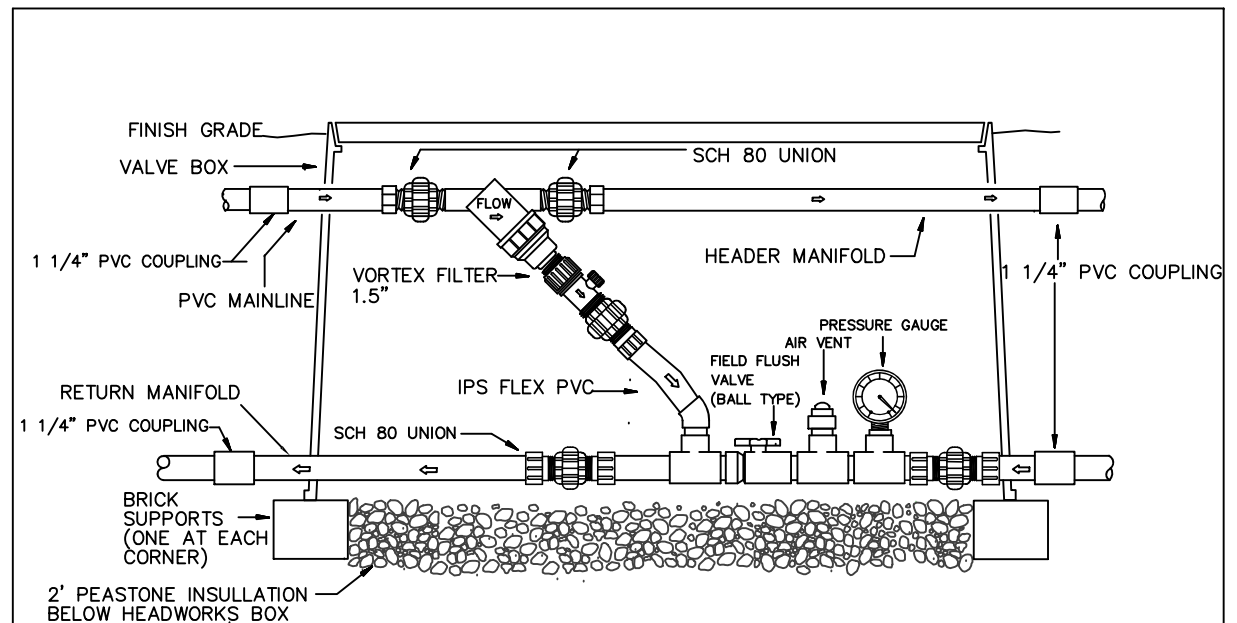
39.11 GALLONS/3.7 GPM = 10.57 MINUTES

4. TOTAL ON/OFF TIME BETWEEN DOSES

24 HOURS/12 DOSES = 2.0 HOURS =120 MINUTES

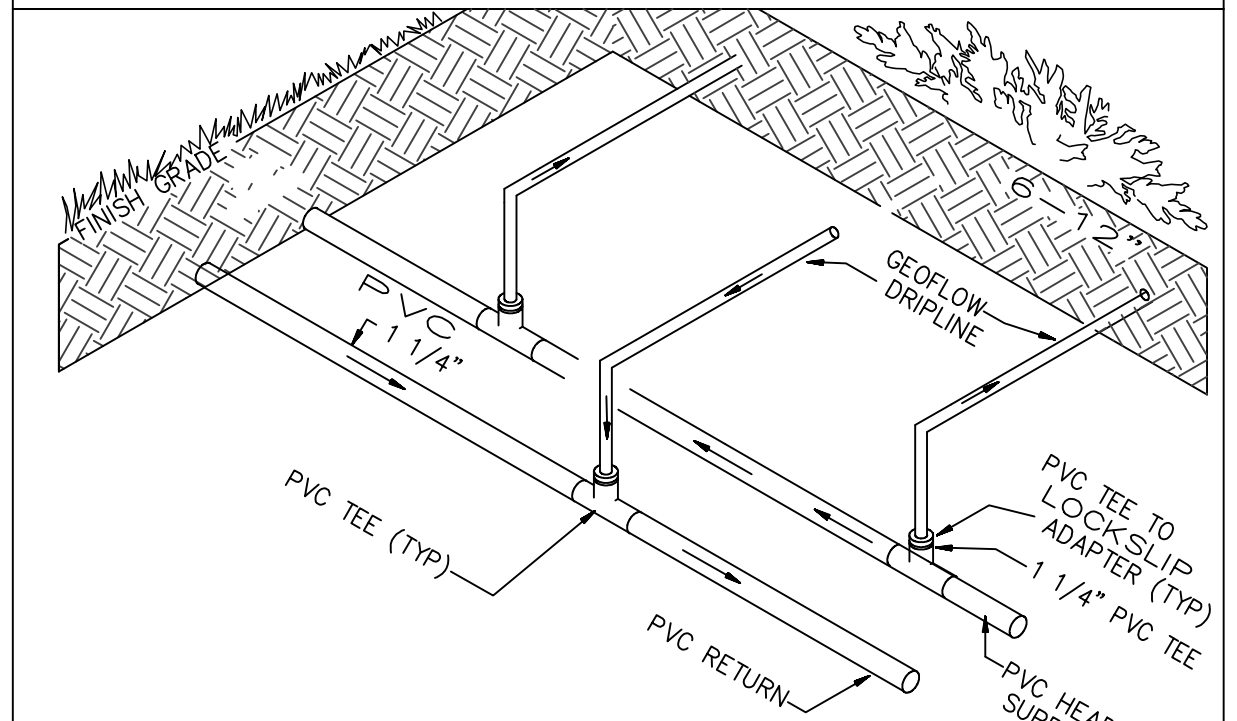
TIMER SETTINGS:

ON: 10 MINUTES 57 SECONDS
OFF: 109 MINUTES 3 SECONDS

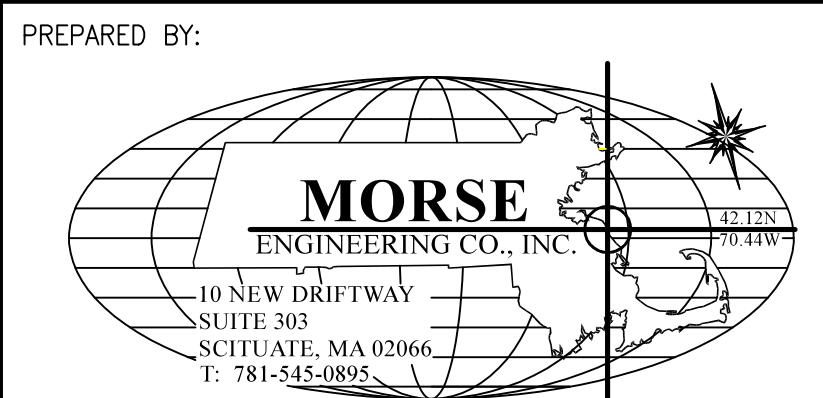
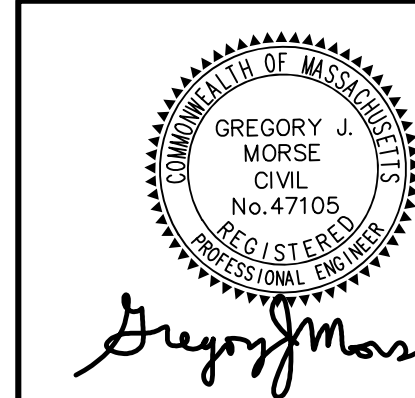
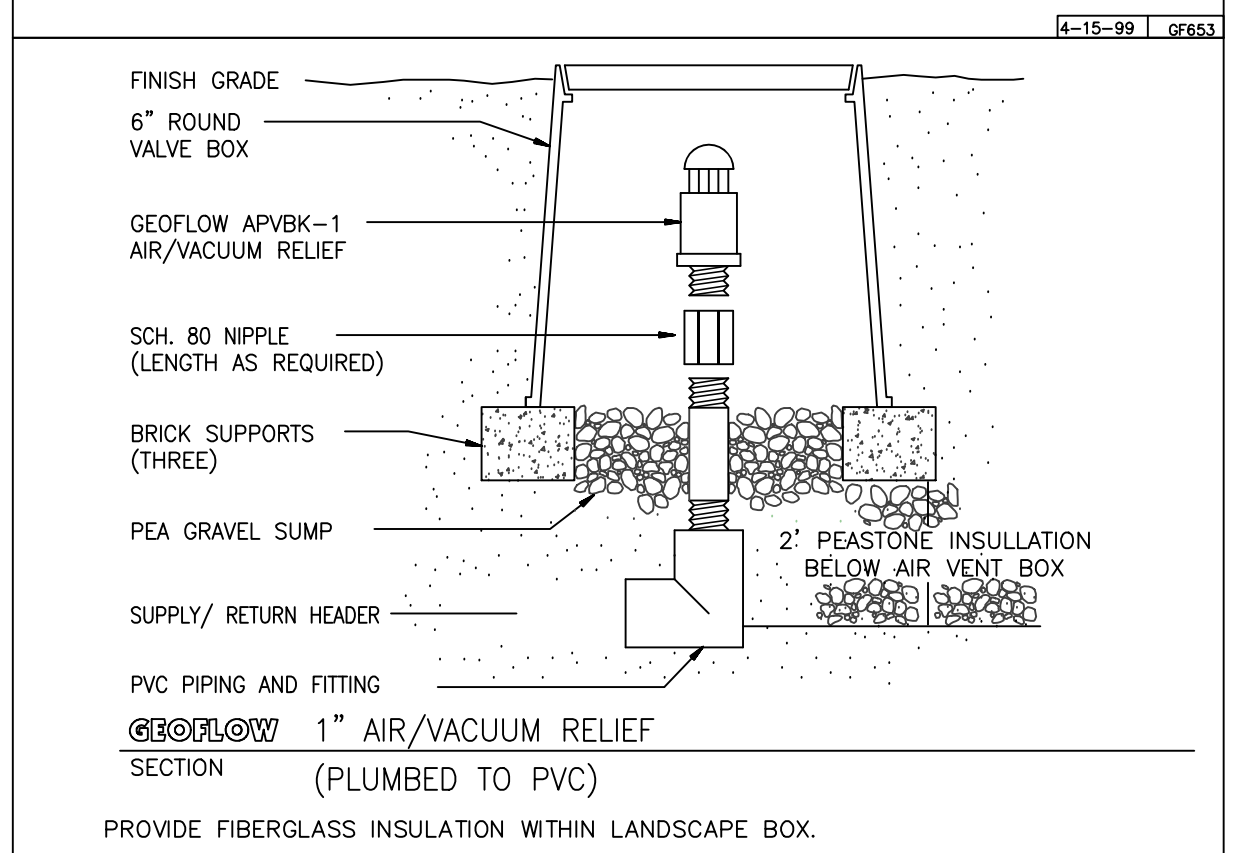


GEOFLOW SIMPLE WASTEFLOW HEADWORKS BOX - MANUAL SECTION

PROVIDE 2" RIGID FOAM INSULATION SURROUNDING EXTERIOR OF LANDSCAPE BOX AND WITHIN INTERIOR OF COVER.



GEOFLOW SUPPLY/RETURN PIPING SECTION



PROJECT: SEPTIC SYSTEM DESIGN PLAN
19 BUTTONWOOD LANE
ASSESSOR'S PARCEL: 5-2-3
SCITUATE, MASSACHUSETTS

APPLICANT: RICHARD MCQUADE
19 BUTTONWOOD LANE
SCITUATE, MASSACHUSETTS 02066

PLAN TITLE: SEPTIC SYSTEM DESIGN PLAN

DESIGN: CRM
CHECK: GJM
JOB NO: 20-119
DATE: 3/9/20
REV:
SHEET: 2 OF 2

CONTRACTOR TO BE HOOT/GEOFLOW CERTIFIED
DEED RESTRICTION REQUIRED
OPERATION & MAINTENANCE CONTRACT REQUIRED