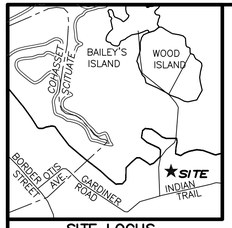


SITE LOCUS
1"=800'

SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: JAMES GARFIELD, SE#14162
SOIL TESTING WITNESSED BY: RALPH H. COLE, P.L.S.
DATE: SEPTEMBER 30, 2020

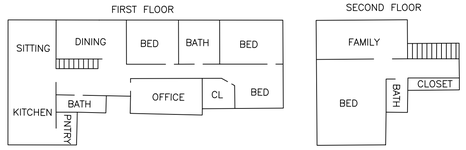
TP–1	APPROX. GRADE EL. 20.8	
EL. 20.4	A HORIZON LOAMY SAND 10YR 3/2	5"
EL. 18.8	B HORIZON LOAMY SAND 10YR 5/6	24"
EL. 16.6	C HORIZON LOAMY SAND 2.5Y 5/4	51"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 17"
PERC. RATE: NONE
ESHGW: 17" (EL. 19.4)

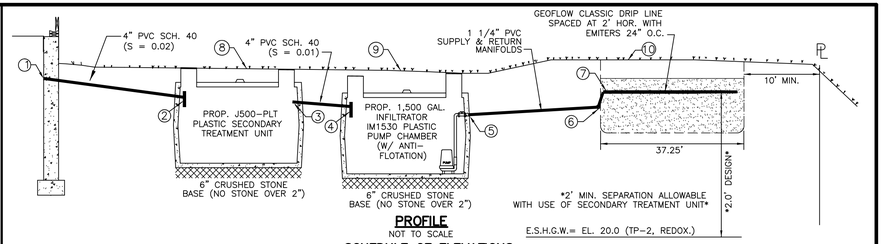
TP–2	APPROX. GRADE EL. 21.5	
EL. 21.0	A HORIZON LOAMY SAND 10YR 3/2	6"
EL. 19.5	B HORIZON LOAMY SAND 10YR 5/6	24"
EL. 17.5	C HORIZON LOAMY SAND 2.5Y 5/4	48"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: 18"
PERC. RATE: 5 MPI @ 0–18"
ESHGW: 18" (EL. 20.0)

DIG SAFE
MA–RI–ME–NH–VT
CALL
TOLL FREE
1–888–344–7233
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM



FLOOR PLAN
N.T.S., SCHEMATIC ONLY

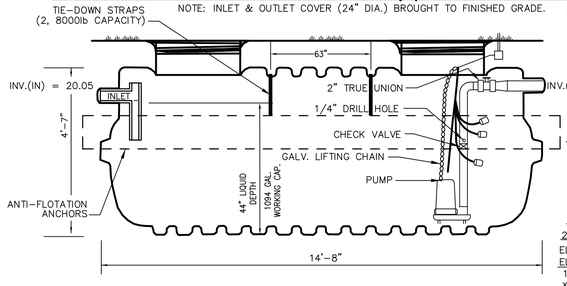


PROFILE
NOT TO SCALE

SCHEDULE OF ELEVATIONS

1. INV. OF PIPE AT FOUNDATION = 20.6± (CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION)	7. INV. OF GEO–FLOW DRIP PIPING = 22.00
2. INV. OF PIPE AT TREATMENT TANK INLET = 20.34	8. FINISHED GRADE OVER JET TANK = 22.3 (MIN) – 24.4 (MAX)
3. INV. OF PIPE AT TREATMENT TANK OUTLET = 20.09	9. FINISHED GRADE OVER PUMP CHAMBER = 21.8 (MIN) – 23.8 (MAX)
4. INV. OF PIPE AT PUMP CHAMBER INLET = 20.05	10. FINISHED GRADE GEO–FLOW PIPING = 22.5 (MIN.) – 24.5 (MAX.)
5. INV. OF PIPE AT PUMP CHAMBER OUTLET = 20.30	
6. INV. OF PIPE AT 1 1/4" SUPPLY & RETURN MANIFOLD (END) = 21.50	

INFILTRATOR IM1530 GAL. PUMP CHAMBER (W/ CONCRETE COLLAR)



ELECTRICAL CONDUIT TO CONTROL PANEL (SIMPLEX OR EQUAL) MOUNTED INSIDE BUILDING. PUMP POWER CABLE AND FLOAT CONTROL TO BE PLACED IN CONDUIT IN ACCORDANCE WITH LOCAL BUILDING AND ELECTRICAL CODES.

EL.= 19.12
6" OVERRIDE PUMP ON EL.= 18.62
9"
LOW WATER/PUMP TIMER OFF: EL.= 17.87
REDUNDANT PUMP OFF EL.= 17.87
18"
EL.= 16.37
24–HOUR EMERGENCY STORAGE (440 GAL. MIN)

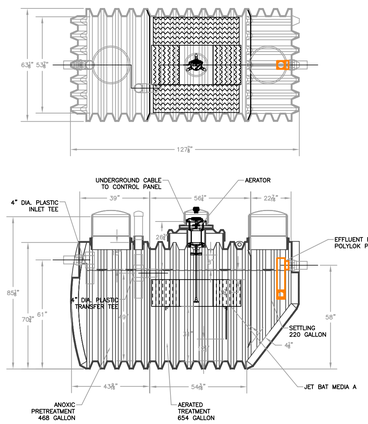
EL.= 20.04 INVERT IN
EL.= 18.54 ALARM ON
1.18' AVAILABLE STORAGE
x 400 GAL./VERT. FOOT = 472 GALLONS

PUMP DESIGN NOTES:
1. USE SUBMERSIBLE EFFLUENT PUMP: ORENCO PF1005 (1/2 HP) OR APPROVED EQUAL CAPABLE OF ATTAINING: TDH=64.5 FT. @ 2.0 GPM. CONTRACTOR TO PROVIDE ENGINEER WITH PUMP SELECTION SPEC SHEET PRIOR TO INSTALLATION.
2. INSTALL HIGH AND LOW WATER MERCURY FLOATS IN PUMP CHAMBER AND ROUTE TO CONTROL PANEL W/ VISIBLE FLASHING AND AUDIBLE ALARMS. PANEL LOCATION TO BE ON EXTERIOR OF BUILDING. COORDINATE LOCATION WITH HOMEOWNER. PUMP POWER SHALL BE LOCATED ON SEPARATE INDEPENENT CIRCUIT FROM THE ALARM CIRCUIT. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN AND INSPECTED BY THE TOWN OF SCITUATE WIRING INSPECTOR.
3. TANK TO BE MADE WATERPROOF.
4. ANTI–FLOTATION TO BE PROVIDED TO MITIGATE BOUYANCY ISSUES WITH HIGH ESGHW.

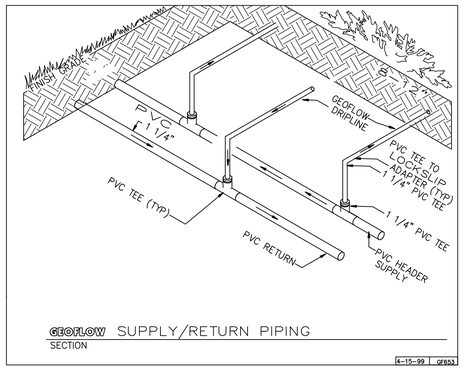
REMOVE & REPLACE
CONTRACTOR TO EXCAVATE ALL UNSUITABLE MATERIAL TO A DEPTH OF 6"± (TO B–HORIZON) & REPLACE WITH CLEAN TITLE 5 PERC SAND TO EL. = 22.0 DIRECTLY UNDER THE PROPOSED SOIL ABSORPTION SYSTEM.
(APPROX. SAND VOL. = 1.2% x 596 S.F. x (22.0–20.4) / 27 = 43± C.Y.

NOTES:
1. PROPOSED SAND BED SHOULD FIRST HAVE ALL A–HORIZON MATERIAL REMOVED TO A DEPTH OF 6"± (TO B HORIZON) TO PREVENT AN ORGANIC LAYER FROM FORMING AND RESTRICTING DOWNWARD WATER MOVEMENT. AFTER EXCAVATION CLEAN TITLE 5 PERC SAND SHOULD BE APPLIED IN SHALLOW LAYERS WITH THE FIRST 4 TO 6 INCHES INCORPORATED INTO THE NATURAL SOIL TO PREVENT AN ABRUPT TEXTURAL INTERFACE. ONCE THE SAND IS IN PLACE, INSTALL AND TEST THE PROPOSED DRIPLINE NETWORK. AFTER PRESSURE TEST ADD 2"(MIN) OF ADDITIONAL SAND OVER THE DRIPLINE NETWORK AND BACK FILL WITH 4–10" OF TOPSOIL. CONTRACTOR SHALL INSTALL 1 SHOVEL–FULL OF DOUBLE WASHED 3/8" PEASTONE OVER EACH DRIP EMITTER PRIOR TO PLACEMENT OF 2" SAND BACKFILL LAYER.
2. FILL MATERIAL SHALL CONSIST OF CLEAN GRANULAR SAND IN CONFORMANCE WITH THE STANDARDS SET FORTH IN 310 CMR 15.255(3). CONTRACTOR TO USE CARE DURING BACKFILL PROCESS AS NO HEAVY MACHINERY SHOULD PASS OVER THE TUBING OR OTHER SYSTEM COMPONENTS ONCE INSTALLED.
3. SUPPLY AND RETURN MANIFOLDS SHALL SLOPE BACK TO THE PUMP CHAMBER AT A MINIMUM SLOPE OF 0.02 FT/FT TO PREVENT FREEZING.
4. ALL DISTURBED AREAS TO BE COVERED WITH 6" MINIMUM SCREENED LOAM & SEEDED WITH GRASS SEED. CONTRACTOR TO STABILIZE SOILS WITH JUTE MESH AND/OR STRAW TO PREVENT EROSION & TO PROMOTE GRASS GROWTH.
*CONTRACTOR TO EXCAVATE ALL CONTAMINATED SOIL ASSOCIATED WITH EXISTING SAS AND REPLACE WITH CLEAN TITLE 5 PERC SAND.

J–500–PLT SECONDARY TREATMENT TANK

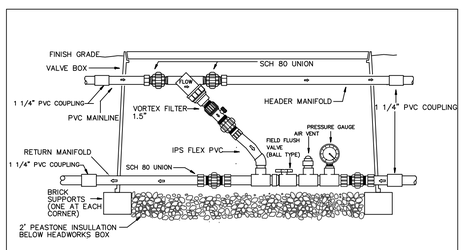


NOTES:
1. TREATMENT TANK TO BE MADE WATERPROOF AND COVERS TO GRADE MADE WATERTIGHT.
2. AERATOR MODEL 700LL MUST BE USED IN CONTINUOUS OPERATION.
3. MAXIMUM BURIAL DEPTH OF 24" FROM TOP OF TANK REQUIRED.
4. J–500 IS CAPABLE OF TREATING UP TO 500 GALLONS OF WASTEWATER WITH AN APPLIED LOADING RATE OF UP TO 0.71 LBS/BOD PER DAY.
5. LEDGE TO BE REMOVED AS REQUIRED TO PLACE TANK PROPERLY.
6. INSTALLER TO CONTACT CLEARWATER RECOVERY IN REGARDS TO PROPERT SYSTEM INSTALLATION AND OPERATION & MAINTENANCE CONTRACT.



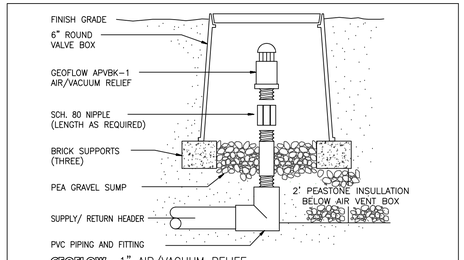
GEOFLOW SUPPLY/RETURN PIPING SECTION

4–15–99 GF653



GEOFLOW SIMPLE WASTEFLOW HEADWORKS BOX - MANUAL SCHEMATIC SECTION

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



GEOFLOW 1" AIR/VACUUM RELIEF SECTION (PLUMBED TO PVC)

PROVIDE FIBERGLASS INSULATION WITHIN LANDSCAPE BOX.

GENERAL NOTES
1. 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.
2. ALL CONSTRUCTION MUST COMPLY WITH TITLE 5 OF THE STATE ENVIRONMENTAL CODE 310 CMR 15 & THE ANY LOCAL BOARD OF HEALTH SUPPLEMENTAL REGULATIONS.
3. THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE BOARD OF HEALTH AND DESIGN ENGINEER.
4. ANY CHANGE IN SITE CONDITIONS, DISCREPANCIES, ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF MORSE ENGINEERING PRIOR TO THE COMMENCEMENT OF WORK.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

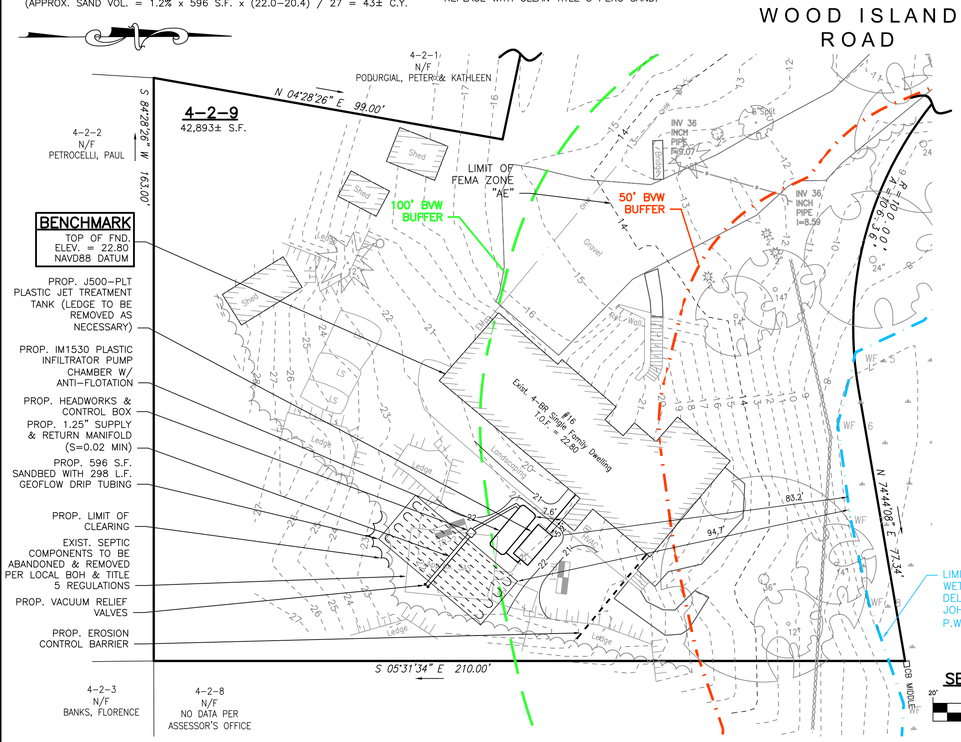
CONSTRUCTION NOTES
1. CONTRACTOR SHALL COORDINATE INSPECTION TIMES WITH THE LOCAL BOARD OF HEALTH AND DESIGN ENGINEER 24–HOURS IN ADVANCE OF THE FOLLOWING INSPECTIONS:
   1. AFTER EXCAVATION OF ALL UNSUITABLE MATERIAL FROM SOIL ABSORPTION AREA.
   2. PRIOR TO COVERING THE CONSTRUCTED SYSTEM.
   3. AFTER SYSTEM BACKFILL AND FINAL GRADING.
2. ALL CONSTRUCTION MUST COMPLY WITH TITLE 5 OF THE STATE ENVIRONMENTAL CODE 310 CMR 15 & THE ANY LOCAL BOARD OF HEALTH SUPPLEMENTAL REGULATIONS.
3. ALL TIGHT–JOINT PLUMBING SHALL BE CONSTRUCTED OF SCH. 40 PVC PIPE WITH CLEANED AND CEMENTED FITTINGS, UNLESS OTHERWISE NOTED.
4. ALL PRECAST/PIPE CONSTRUCTION JOINTS AND FITTINGS SHALL BE MADE WATERTIGHT BY PARGING WITH HYDRAULIC CEMENT.
5. 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

6. 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.
7. THE CONTRACTOR SHALL INSTALL MAGNETIC TAPE OVER SYSTEM PIPING & COMPONENTS
8. THE DESIGN ENGINEER SHALL CERTIFY AND PREPARE AN "AS–BUILT" PLAN FOR SUBMITTAL TO THE BOARD OF HEALTH UPON SEPTIC SYSTEM COMPLETION.
9. ALL DISTURBED AREAS SHALL BE RESTORED WITH 4" LOAM & SEED POST CONSTRUCTION.
10. ALL SEPTIC SYSTEM COMPONENTS TO BE STAKED OUT BY PROFESSIONAL LAND SURVEYOR PRIOR TO SYSTEM INSTALLATION.
11. 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
1. LOCUS DOES NOT LIE WITHIN A DEP DESIGNATED ZONE II RESOURCE AREA.
2. ALL KNOWN WETLANDS WITHIN 100 FEET OF THE PROPOSED SEWAGE SYSTEM ARE SHOWN.
3. PROPERTY LINE DATA WAS OBTAINED FROM RECORDED DEED (36327–192) AND RECORDED PLANS ON FILE AT THE PLYMOUTH COUNTY REGISTRY OF DEEDS.
4. THERE WERE NO ACTIVE/POTABLE WELLS OBSERVED WITHIN 100' OF THE PROPOSED SYSTEM.
5. LOCUS LIES IN FEMA ZONES "AE" (EL. 14) & "X" AS SHOWN ON FEMA COMMUNITY MAP PANEL 25021C 0107K DATED NOVEMBER 4, 2016. ZONE "X" IS NOT A SPECIAL FLOOD HAZARD AREA, ZONE "AE" IS.

OPERATION & MAINTENANCE CONTRACT REQUIRED
DEED RESTRICTION REQUIRED
INSTALLER TO BE JET & GEOFLOW CERTIFIED



SEPTIC LAYOUT
20' 0 10' 20'
SCALE: 1" = 20'

DESIGN DATA
1. BUILDING TYPE: SINGLE FAMILY DWELLING
2. NO. OF BEDROOMS: 4
3. DESIGN FLOW: 4 x 110 GPD/BEDROOM = 440 GPD
4. DESIGN PERCOLATION RATE: 5 MPI (TP–2, CLASS I)
5. GARBAGE DISPOSAL: NO
6. SEPTIC TANK DESIGN REQUIREMENT: 200% DESIGN FLOW 440 X 2 = 880 GAL. (PROVIDE NEW J–500 TREATMENT TANK)
7. LEACH AREA REQUIREMENTS GALLONS/SQ. FT. BOTTOM: 0.74 GAL./S.F. SIDE: 0.74 GAL./S.F.
8. TOTAL LEACH AREA REQUIRED: TITLE 5: 440 GPD / (0.74 GPD/S.F.) = 595 S.F. GEO–FLOW DRIP IRRIGATION SAND BED PROVIDED AREA = 596 S.F. SAND BED W/ 298 L.F. DRIP TUBING

LOCAL UPGRADE APPROVAL REQUESTS
310 CMR 15.405.1(b): TO ALLOW A REDUCTION OF THE SETBACK OF 10 FT. (REQ'D) TO 5.2 FT. (PROP.) BETWEEN THE SEPTIC TANK AND CELLAR WALL.
310 CMR 15.405.1(j): TO ALLOW A REDUCTION OF THE REQUIREMENT OF 12 INCHES OF SEPARATION BETWEEN THE INLET AND OUTLET TEES AND HIGH GROUNDWATER.

I/A TECHNOLOGY CREDIT
1. TO ALLOW A REDUCTION FROM 4–FT. TO 2–FT. SEPARATION BETWEEN THE BOTTOM OF THE SOIL ABSORPTION SYSTEM AND SEASONAL HIGH GROUNDWATER TABLE.
2. TO ALLOW A NATURALLY OCCURRING PERVIOUS MATERIAL OF 2 FT.
3. TO ALLOW UP TO A 50% SIZE REDUCTION IN THE SAS.

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 = 37 GAL.
   DRAIN BACK VOLUME
   1 1/4" DELIVERY LINE
   $\pi (R)^2 = \pi (.052)^2$ X 35.0' = 0.30 CF X 7.48 G/SF = 2.2 GAL.
   PUMPING VOLUME = DOSING VOLUME + DRAIN BACK VOLUME
   39.2 GALS = 37 GAL. + 2.2 GAL.
2. FLOW RATE INTO SOIL
   LENGTH OF WASTEFLOW DRIPLINE = 298 FEET
   NUMBER OF EMITTERS = 149
   EMITTERS FLOW RATE = 1.16 GPH FROM GEOFLOW
   TOTAL FLOW RATE = 149 x 1.16 = 173 GPH/60 MIN. = 2.9 GPM
3. DOSAGE TIME
   39.2 GALLONS/2.9 GPM = 13 MINUTES 15 SECONDS
4. TOTAL ON/OFF TIME BETWEEN DOSES
   24 HOURS/12 DOSES = 2.0 HOURS =120 MINUTES
   TIMER SETTINGS:
   ON: 13 MINUTES 15 SECONDS
   OFF: 106 MINUTES 45 SECONDS

COMMONWEALTH OF MASSACHUSETTS
GREGORY J. MORSE
CIVIL
No. 47105
REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:
MORSE ENGINEERING CO., INC.
10 NEW DRIFTWAY
SUITE 303
SCITUATE, MA 02066
T: 781-545-0895

PROJECT: SEPTIC SYSTEM DESIGN PLAN 16 WOOD ISLAND ROAD (ASSESSOR'S PARCEL: 4–2–9) SCITUATE, MASSACHUSETTS	DESIGN: PGG CHECK: GJM JOB NO: 20–325 DATE: 10/27/20 REV:
APPLICANT: HENRY YEH 16 WOOD ISLAND SCITUATE, MA 02066	
PLAN TITLE: SEPTIC SYSTEM DESIGN PLAN	SHEET: 1

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