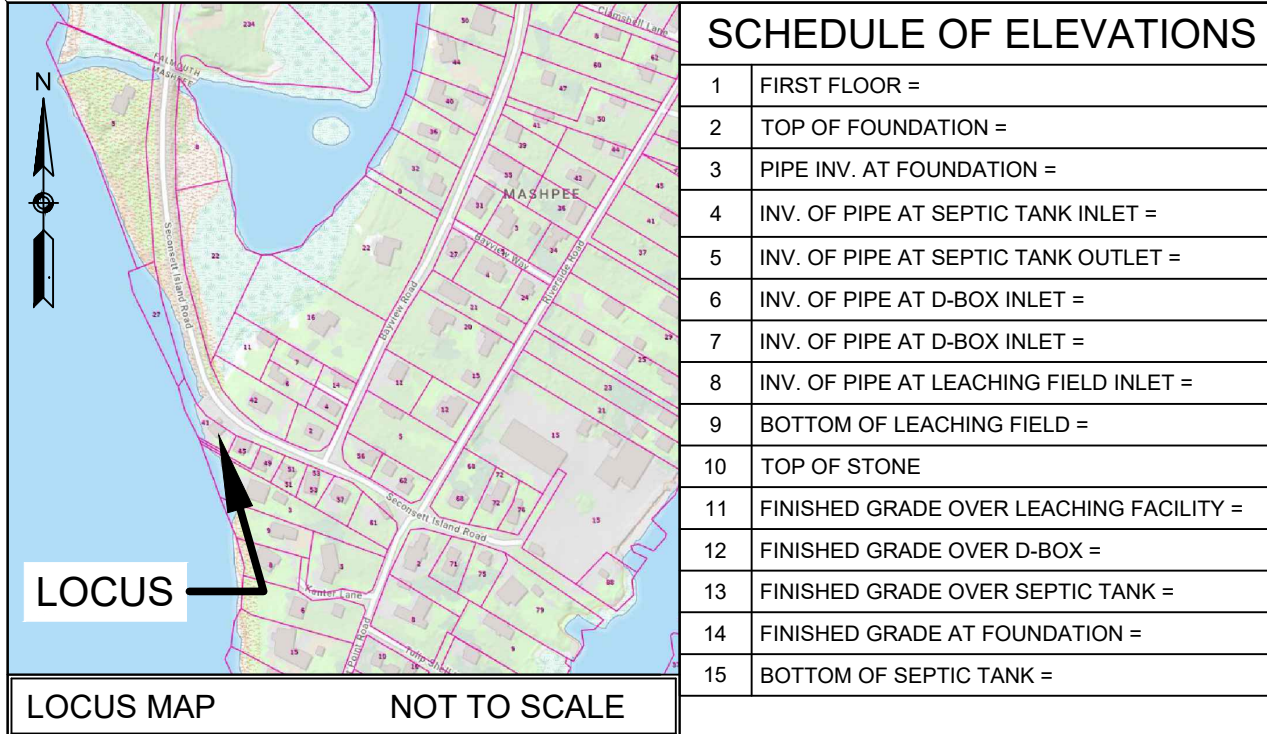




PRECAST STRUCTURE BUOYANCY CALCULATIONS

FAST SYSTEM LOW PROFILE H-20
DOWNWARD FORCE = 25,000 LBS
BUOYANCY UPWARD FORCE = 7,965 LBS
SAFETY FACTOR (COASTAL FLOODING) = 25,000 LBS / 7,965 LBS = 3.1

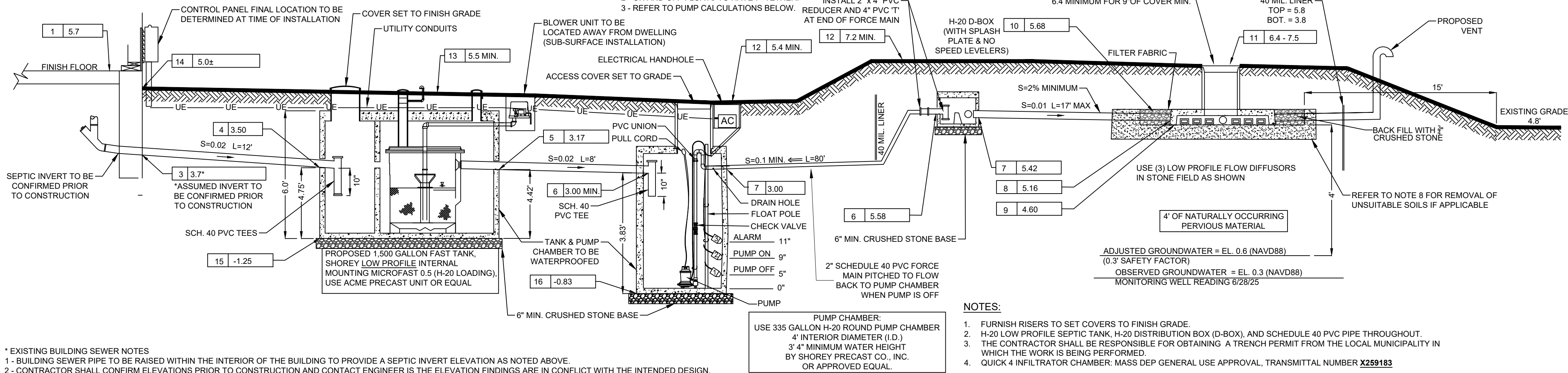
PROPOSED PUMP CHAMBER
DOWNWARD FORCE = 6,700 LBS
BUOYANCY UPWARD FORCE = 1,615 LBS
SAFETY FACTOR = 6,700 LBS / 1,615 LBS = 4.2

DWELLING

SEWAGE SYSTEM PROFILE & DETAILS

PUMP SYSTEM NOTES:

- 1 - ALL PUMP FLOATS SHALL BE LOCATED AWAY FROM INLET FLOW.
- 2 - ON AND OFF FLOATS TO HAVE 7" TETHER.
- 3 - REFER TO PUMP CALCULATIONS BELOW.



- * EXISTING BUILDING SEWER NOTES
- 1 - BUILDING SEWER PIPE TO BE RAISED WITHIN THE INTERIOR OF THE BUILDING TO PROVIDE A SEPTIC INVERT ELEVATION AS NOTED ABOVE.
 - 2 - CONTRACTOR SHALL CONFIRM ELEVATIONS PRIOR TO CONSTRUCTION AND CONTACT ENGINEER IF THE ELEVATION FINDINGS ARE IN CONFLICT WITH THE INTENDED DESIGN.

LOCAL UPGRADE APPROVAL & VARIANCE REQUEST

NO	DESCRIPTION	BYLAW REQUIRED	TITLE 5 REQUIRED	PROPOSED	WAIVER
1	SOIL ABSORPTION SYSTEM TO WETLAND (COASTAL BANK)	75 FT.	50 FT.	20 FT.	55 FT. TOWN 30 FT. STATE
2	FAST TANK TO WETLAND (COASTAL BANK)	25 FT.	25 FT.	21 FT.	4 FT.
3	PUMP CHAMBER TO WETLAND (COASTAL BANK)	25 FT.	25 FT.	14 FT.	11 FT.
3	DISTANCE FROM PROPERTY LINE TO FAST TANK	10 FT.	10 FT.	2 FT.	8 FT.
4	DISTANCE FROM PROPERTY LINE TO SAS	10 FT.	10 FT.	4.3 FT.	5.7 FT.
5	DEPTH TO GROUNDWATER	--	5 FT.	4 FT.	1 FT.*
6	SEPERATION TO SLAB FDN TO LEACH FIELD	--	10 FT.	4.2 FT.	5.8 FT.*

- * DEPTH TO GROUNDWATER WITH FAST SYSTEM APPROVED UNDER GENERAL PERMIT SEPARATION FROM SLAB FOUNDATION TO LEACH FIELD WITH IMPERVIOUS BARRIER PROPOSED.

EXISTING STRUCTURE TO BE REPLACED TO MEET FLOOD CODES WITH NO ADDITIONAL FLOW. PROPOSED SEPTIC TO MEET 310 CMR 15 TO THE MAXIMUM FEASIBLE EXTENT

APPROVAL FOR A 2 BEDROOM MINIMAL DESIGN FOR THE LEACH FIELD WITH LOCAL APPROVAL AND DEED RESTRICTION FOR 2 BEDROOMS ON THE PROPERTY RECORDED AT THE REGISTRY OF DEEDS

A MICROFAST INNOVATIVE ALTERNATIVE SYSTEM IS PROPOSED TO PROVIDE BETTER TREATMENT COMPARED TO A CONVENTIONAL SEPTIC SYSTEM.

PUMP CHAMBER NOTES AND DOSING CALCULATIONS

PROPOSED PUMP DISCHARGE RATE = 36 GALLONS PER MINUTE (GPM) @ 10.1 TDH
PROPOSED DOSE PER CYCLE = 220 GALLONS / 8 = 27.5 GALLONS
DELIVERY (FORCE MAIN) PIPE VOLUME = 2" D @ 80 L.F. = 13 GALLONS
DELIVERY + DOSED VOLUME = 27.5 GALLONS + 13 GALLONS = 40.5 GALLONS

PUMP CHAMBER SIZE: 4'0" x 3'3" HIGH (34 GALLONS PER FOOT = 12.6 CF/FT)
DEPTH OF DOSE = (40.5 GAL/7.48 GAL/CU.FT.) / (12.6 CF) = 0.45 FT. === USE 5 INCHES
DEPTH OF DAILY FLOW = (220 GAL/7.48 GAL/CU.FT.) / (12.6) = 2.33 FT. === USE 28 INCHES

FRICITION LOSS CALCULATIONS:

- 1) VERTICAL HEAD LOSS:
EL. 5.58 (D-BOX INLET) - EL. -0.3 (PUMP CHAMBER BOTTOM) = 5.9 FT.
- 2) FRICTION HEAD LOSS:
80 FT. OF 2" PVC PIPE x 3.5 FT./100 FT. @ 36 GAL./MIN = 2.8 FT.
- 3) MINOR HEAD LOSS FROM FITTINGS (EQUVALENT LENGTH OF 53 FT.) = 70 FT. OF 2" PVC PIPE x 3.5 FT./100 FT. @ 36 GAL./MIN = 2.5 FT.

TOTAL HEAD LOSS = 5.9 FT. + 2.8 FT. + 2.5 FT. = 11.2 FT. AT 36 GALLONS PER MINUTE

USE LIBERTY MODEL FL30 SERIES 1/3 H.P. RATED AT 36 G.P.M. FOR 11.2 FT. OF HEAD (OR EQUAL)
ESTIMATED PUMP RUN TIME PER DOSE = 0.76 MINUTES

INSTALL THREE MERCURY FLOAT SWITCHES: OFF, ON AND ALARM.
ALARM ACTIVATION WILL INDICATE PUMP FAILURE.
A MINIMUM OF 24 HOUR RESERVE CAPACITY IS PROVIDED ABOVE ALARM ACTIVATION.
220 GALLONS OF RESERVE CAPACITY IS PROVIDED ABOVE ALARM PER MINIMUM REQUIREMENTS.
ELECTRICIAN SHALL INSTALL A SIMPLEX CONTROL PANEL TO BE LOCATED IN AN ACCESSIBLE AREA. AN ELECTRICAL PERMIT IS REQUIRED FOR ALARM AND PUMP INSTALLATION.

CONSERVATION NOTES

PRIOR TO ANY WORK COMMENCING, THE DEP FILE NUMBER SHALL BE POSTED ON A SIGN ON THE STREET SIDE OF THE LOT AND MAINTAINED IN A VISIBLE CONDITION THROUGHOUT THE PROJECT. THE LIMIT OF WORK WILL BE INSTALLED PRIOR TO ANY WORK, EXCAVATION, CONSTRUCTION OR CLEARING OF VEGETATION, IN ORDER TO PREVENT DAMAGE TO THE INTERESTS OF THE ACT AND BYLAW. THE LIMIT OF STAKED SEDIMENT STOP OR COMPOST ROLL WITH SILT FENCE BACKING. THE SEDIMENT STOP ROLL WILL BE REPLACED AS NECESSARY TO BE MAINTAINED IN GOOD CONDITION THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. NO FILL WILL BE ALLOWED TO BE PLACED AGAINST THE LIMIT OF WORK AT ANY TIME. UPON COMPLETION OF ALL CONSTRUCTION AND STABILIZATION OF THE SITE, SEDIMENT STOP ROLL WILL BE REMOVED AND PROPERLY DISPOSED OF.

PRIOR TO ANY WORK COMMENCING, ADVANCE WRITTEN NOTIFICATION WILL BE PROVIDED TO THE LOCAL CONSERVATION COMMISSION.

NO DEBRIS, EQUIPMENT OR MATERIALS WILL BE STORED, EVEN TEMPORARILY, OUTSIDE THE DESIGNATED LIMIT OF WORK AREA WITH THE EXCEPTION OF EQUIPMENT AND MATERIALS RELATED TO THE PLANTINGS FOR THE REQUIRED MITIGATION.

THE CONSTRUCTION SITE WILL BE CLEANED DAILY TO REMOVE ANY LOOSE DEBRIS.

ALL DISTURBED AREAS WITHIN THE LIMIT OF WORK REQUIRING RESTORATION WILL BE STABILIZED TO PREVENT EROSION. STABILIZATION WILL BE DONE IMMEDIATELY FOLLOWING COMPLETION OF CONSTRUCTION.

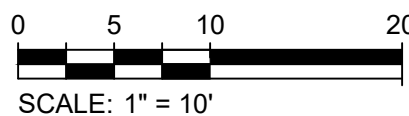
WORK AREA LIES COMPLETELY WITHIN PREVIOUSLY DISTURBED BUFFER ZONE AREAS.

ANY NEW LAWN AREAS WITHIN LOCAL CONSERVATION JURISDICTION SHALL BE PLANTED WITH GRASS SPECIES CONSISTING OF FESCUE AND RYES WITH BLUEGRASS VARIETIES COMPRISING NO MORE THAN 10% OF THE SEED MIX.

IF APPLICABLE, FERTILIZER APPLICATION AND LAWN MAINTENANCE TO BE PERFORMED IN ACCORDANCE WITH LOCAL REGULATION NITROGEN LOADING/LAWN STANDARDS.

PROJECT STATISTICS

1. DISTURBANCE WITHIN LAND SUBJECT TO COASTAL STORM FLOWAGE: 2,325 S.F.
2. PROPOSED UNDISTURBED 75' BUFFER AREA: 2,325 S.F.
3. PROPOSED DISTANCE FROM FAST TANK TO COASTAL BANK: 21 FEET
4. PROPOSED DISTANCE FROM PUMP CHAMBER TO COASTAL BANK: 14 FEET
5. PROPOSED DISTANCE FROM LEACH FIELD TO COASTAL BANK: 20 FEET



DESIGN DATA

1. TYPE OF ESTABLISHMENT: 2-BEDROOM SINGLE FAMILY RESIDENCE
2. SEWAGE SYSTEM DESIGN FLOW: 110 GALLONS PER BEDROOM = 110 x 2 = 220 GPD
3. NOTE: THIS SEPTIC SYSTEM IS NOT DESIGNED FOR A GARBAGE GRINDER
4. SEPTIC TANK CAPACITY REQUIRED, MINIMUM OF 200% OF DESIGN FLOW OR 1,500 GAL. = 200% x 220 GALLON = 440 GALLON (USE 1,500 GALLON TANK)
5. DESIGN PERCOLATION RATE: ASSIGNED LESS THAN 5 MINUTES PER INCH
6. SOIL ABSORPTION SYSTEM TYPE: CHAMBER SYSTEM
7. LEACHING AREA REQUIRED: 2 BEDROOM MINIMUM DESIGN WITH DEED RESTRICTION MINIMUM 220 GPD / (0.74 GPD/S.F., CLASS 5 SOIL) = 297.3 S.F.
8. LEACHING SYSTEM PROPOSED: 20.0' Long x 14.0' Wide x 6.5' HIGH SYSTEM
BOTTOM AREA PROPOSED = 20.0' x 14' = 280.0 S.F.
SIDE AREA PROPOSED = 2 x (20.0' + 14') x 0.54' = 36.7 S.F.
TOTAL AREA PROPOSED = 280.0 + 36.7 = 316.7 S.F.
9. LEACHING SYSTEM CAPACITY PROPOSED = 316.7 x 0.74 GPD/S.F. = 234.4 GPD

SOIL EVALUATOR'S LOG

Depth from surface in inches	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottles and Depth	Other Relative Factors
DEEP OBSERVATION HOLE TH# 1&2, ELEVATION 6.0					
0 - 4"	A	SANDY LOAM	10 YR 3/2		
4" - 12"	B	LOAMY SAND	10 YR 5/6		
12" - 85"	C	COARSE SAND	10 YR 7/3	NO	SINGLE GRAIN

PERCOLATION RATE = < 2 MINUTES / INCH IN C LAYER
DEPTH TO GROUNDWATER = STANDING WATER AT 72" (ELEV. 0.0 NAVD88)
ADJUSTED HIGH GROUNDWATER = PER MONITOR WELL 0.3 FEET (NAV D88)
OBSERVATIONS BY: CHUCK ROWLAND, P.E.
WITNESSED BY: ZACK SEABURY, R.S.
DATE TESTED: JUNE 27, 2025

GENERAL NOTES

LOCATIONS ARE BASED ON AN "ON THE GROUND" INSTRUMENT SURVEY AND ELEVATIONS BASED ON THE NAVD 1988 DATUM. COORDINATE SYSTEM USED IS THE MA-MAINLAND COORDINATE SYSTEM, DATUM: NAD 83, UNITS: U.S. SURVEY FEET.

DIMENSIONS OF EXISTING BUILDINGS AND BUILDING OFFSETS SHOWN HEREON ARE TO CORNER BOARDS OR SIDING EXTENTS AND ARE DISPLAYED IN ENGINEERING UNITS WITH A PRECISION OF ONE TENTH (0.1') OF A FOOT. LOT COVERAGE IS CALCULATED TO CORNER BOARDS.

THE FINISHED FLOOR ELEVATION (FIN. FL. EL.) SHOWN HEREON IS BASED ON AN ASSUMED 1" LOWER THAN THE SURVEYED THRESHOLD ELEVATION. AN INTERIOR INSPECTION OF BUILDINGS WAS NOT PERFORMED.

ZONING DISTRICT: R3

PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE DESIGNATION OF VE (ELEV. 14') & AE (ELEV. 11') BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 25001C0734J, WITH A MAP EFFECTIVE DATE OF JULY 16, 2014.

THIS LOT IS NOT LOCATED WITHIN A DEP APPROVED ZONE II WELLHEAD PROTECTION AREA.

THIS LOT IS NOT MAPPED WITHIN A MESA NATURAL HERITAGE AND ENDANGERED SPECIES AREA.

WIND EXPOSURE CATEGORY: ZONE C

LOT COVERAGE:
LOT AREA TOTAL = 4,728 S.F.
EXISTING LOT COVERAGE BY STRUCTURES: = 734 S.F. (15.5%)
LOT AREA ABOVE THE FLOOD ZONE = 0 S.F.
EXISTING LOT COVERAGE BY STRUCTURES: = 734 S.F. (100.0%)

1" THE AREA NOTED IN THE LOT COVERAGE CALCULATION IS THE AREA USED FOR THE PURPOSE OF REPORTING AND CALCULATING THE TOWN OF MASHPEE ZONING LOT COVERAGE IN ACCORDANCE TO REGULATION §174-31 LAND SPACE REQUIREMENT TABLE FOOTNOTE 16. THIS AREA REPRESENTS LAND ABOVE THE FLOOD ZONE.

A COMPREHENSIVE ZONING ANALYSIS HAS NOT BEEN PERFORMED BEYOND THE ITEMS LISTED ABOVE.

DEED REFERENCE: CERTIFICATE 24104

PLAN REFERENCE: LC PLAN 205669-C

OWNER: PATRICIA THOMPSON PETERS
41 SECONSETT ISLAND ROAD
MASHPEE, MA 02649

SEPTIC SYSTEM NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 (310 CMR 15.00), AND THE LOCAL BOARD OF HEALTH.
2. THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER AND LOCAL BOARD OF HEALTH.
3. ALL ERRORS, OMISSIONS, AND CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
4. ALL DISTURBED AREAS ARE TO BE LOAMED, SEEDED AND MAINTAINED TO PREVENT EROSION.
5. FOR PROPER PERFORMANCE, SEPTIC TANK SHOULD BE INSPECTED AT LEAST ONCE A YEAR AND WHEN THE TOTAL DEPTH OF SCUM AND SOLIDS EXCEEDS 1/3 THE LIQUID DEPTH OF THE TANK, THE TANK SHOULD BE PUMPED.
6. THIS SYSTEM HAS BEEN DESIGNED FROM DATA REVIEWED AND ACKNOWLEDGED BY THE MASS. D.E.P. AND THE LOCAL BOARD OF HEALTH; AND CONFORMS WITH THE REQUIREMENTS OF THE STATE ENVIRONMENTAL CODE, TITLE 5. NO GUARANTEE OF PERFORMANCE IS EXPRESSED OR IMPLIED.
7. TEST HOLE INFORMATION SHOWN HEREON IS LIMITED TO SOIL CONDITIONS FOUND AT THAT PARTICULAR TEST HOLE LOCATIONS AND IS NOT CONSIDERED AN IMPLIED OR EXPRESSED WARRANTY OF SOIL CONDITIONS BEYOND LIMITS OF SUCH TEST HOLES.
8. ALL ORGANIC AND UNSUITABLE MATERIAL MUST BE REMOVED FROM THE AREA DIRECTLY UNDER AND 5 FEET BEYOND THE PROPOSED LEACHING FACILITY. THIS AREA MUST BE BACKFILLED TO THE ELEVATIONS INDICATED ON THESE PLANS WITH SELECT ON-SITE OR IMPORTED SOIL MATERIAL, CONSISTING OF CLEAN GRANULAR SAND OR OTHER GRANULAR MATERIAL, FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. MIXTURES AND LAYERS SHALL NOT BE USED. THE FILL MATERIAL SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 - 310 CMR SECTION 15.255 (3) AND SHALL HAVE PERCOLATION RATE OF BETWEEN TWO AND FIVE MINUTES PER INCH, BEFORE AND AFTER PLACEMENT.
9. ALL STONE MUST BE DOUBLE WASHED AND FREE FROM FINES AND ANY ORGANIC MATERIAL MUST HAVE LESS THAN 0.2 PERCENT MATERIAL FINER THAN A NUMBER 200 SIEVE.
10. THE DESIGNER HAS NOT BEEN RETAINED BY THE CLIENT TO CONSTRUCT OR SUPERVISE THE CONSTRUCTION OF THE SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION OF INSTALLATION OF THE SYSTEM WITH THE LOCAL BOARD OF HEALTH.
11. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS.
12. TIGHT JOINT PIPING MATERIAL TO CONSIST OF POLYVINYL CHLORIDE (P.V.C.) SCHEDULE 40, UNLESS OTHERWISE NOTED.
13. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER FOR CONSTRUCTION INSPECTION AFTER EXCAVATION FOR THE LEACHING BED (PRIOR TO THE PLACEMENT OF STONE) AND ALSO AFTER PLACEMENT OF PIPE & STONE PRIOR TO BACKFILLING.
14. DESIGN ENGINEER SHALL CERTIFY CONSTRUCTION OF SYSTEM AND MATERIALS INSTALLED. THE CONTRACTOR SHALL PROVIDE A SIEVE ANALYSIS OF THE FILL MATERIAL REQUIRED. AN AS-BUILT PLAN SHALL BE SUBMITTED TO THE LOCAL BOARD OF HEALTH UPON COMPLETION.
15. NO RUBBER TIRE CONSTRUCTION MACHINERY SHALL DRIVE OVER THE PROPOSED SEPTIC BED EXCAVATION DURING CONSTRUCTION.
16. DIG-SAFE AND ALL OTHER NECESSARY AUTHORITIES SHALL BE NOTIFIED FOR THE PROPER LOCATION OF EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
17. WATER SERVICE LINE SHALL BE LOCATED AND MARKED PRIOR TO ANY EXCAVATING AND 10' MIN. SETBACK DISTANCE FROM SAID SERVICE TO THE SEPTIC SYSTEM SHALL BE MAINTAINED.
18. ALL WATER LINES WITHIN 10' OF SEPTIC SYSTEM COMPONENTS SHALL BE SLEEVED WITHIN 4" PVC SCHEDULE 40 PIPE.

NOTICE
THIS PLAN MAY NOT BE ADDED TO, DELETED FROM, OR ALTERED IN ANY WAY BY ANYONE OTHER THAN CAPE & ISLANDS ENGINEERING, INC.

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DATE	DESCRIPTION	BY	CHK

PREPARED FOR:

PATRICIA THOMPSON PETERS
41 SECONSETT ISLAND ROAD
MASHPEE, MA 02649

PROJECT:

41 SECONSETT ISLAND ROAD
MASHPEE, MASSACHUSETTS

SHEET NO.: 1 OF 1

DATE: JULY 1, 2025

DRAWN BY: JGP/CTR

CHECKED BY: CTR/JJF

PREPARED BY:

CAPE & ISLANDS
ENGINEERING

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508.477.9072 FAX
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DRAWING TITLE:

PROPOSED SEPTIC PLAN

ASSESSORS INFORMATION: MAP 119-10-0