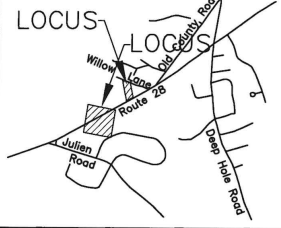
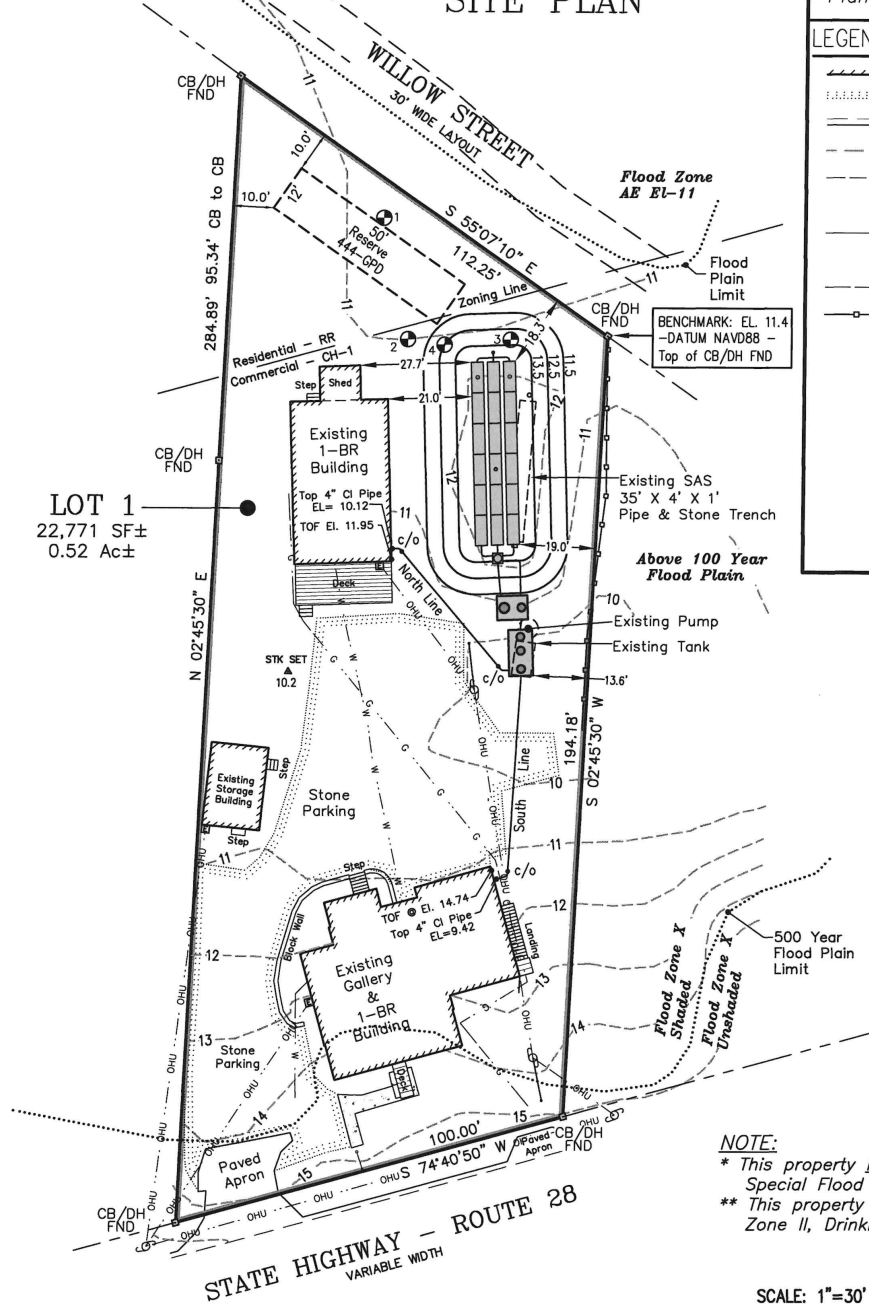


Wells not shown exceed 150' from the proposed SAS

SITE PLAN



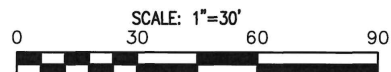
Assessors' ID: 24-T4
Deed: Book 11347, Page 124
Plan: Book 233, Page 67, Lot 1

LEGEND

	Existing Building
	Edge of Stone
	Edge of Pavement
	Existing Contour
	Overhead Utility Lines
	Existing Utility Pole
	Existing Guy Pole
	Existing Electric Meter
	Existing Water Line
	Existing Fence
	Test Hole
	Existing Septic Components

NOTE:

- * This property is not located within a Special Flood Hazard Area.
- ** This property is not located within a Zone II, Drinking Water Protection District



MORAN ENGINEERING ASSOCIATES

508-432-2878

941 ROUTE 28, HARWICH, MA

SEPTIC DESIGN PLAN

Prepared For: Susan C Lilley

820 ROUTE 28

HARWICH PORT, MA

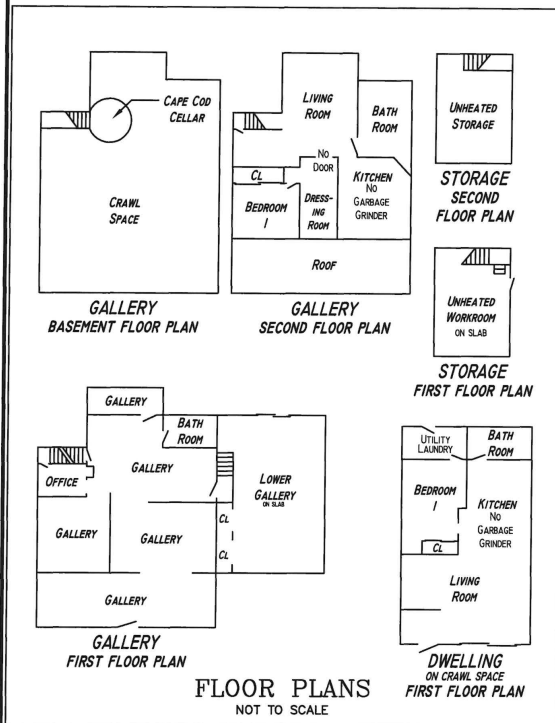
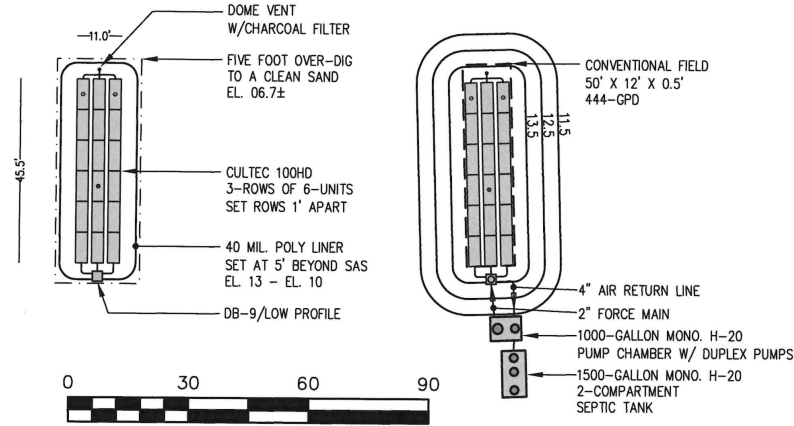
PROJECT: 23-258

SHEET 1 of 2

DATE: 01/07/25

DETAILS OF SOIL ABSORPTION SYSTEM

SCALE 1" = 30'



DESIGN CALCULATIONS

- REQUIRED FLOW: 420-GALLON PER DAY
1815 GROSS SF RETAIL/GALLERY
PER 1000 SF 50 GPD. 200 GPD MIN. DESIGN FLOW
- 2- BEDROOMS X 110 GPD/B.R. = 220 GPD
- SEPTIC TANK CAPACITY: 420 GPD X 200% = 840 GPD
USE: 2-COMPARTMENT MONO. 1500-GALLON SEPTIC TANK (H-20)
TANK BAFFLE LOCATION AT 2/3 -1/3.
- PUMP CHAMBER: 1000-GALLON MONO. H-20 WITH DUPLEX PUMPS
- LEACH DESIGN: *PER MASS. DEP APPROVAL FOR GENERAL USE (3/31/16).
18-CULTEC CONTACTOR 100HD
 $(6 \text{ CHAMBERS} \times 7.5' / \text{CHAMBER}) + 0.5' \text{ LENGTH ADJUSTMENT} = 45.5 \text{ LF/ROW}$
 $45.5 \text{ LF} \times 5.0 \text{ SF/LF} = 227.5 \text{ SF}$
 $227.5 \text{ SF} \times 3 \text{ ROWS} = 682.5 \text{ SF}$
 $682.5 \text{ SF} \times 0.74 \text{ GPD/SF} = 505.05 \text{ GPD}$
505 GPD PROVIDED > 420 GPD REQUIRED
- USE:
(3) ROWS OF 6-CULTEC CONTACTOR 100HD CHAMBERS.
SET ROWS 1' APART. COVER CHAMBERS WITH CULTEC 410 FILTER FABRIC AND BACKFILL TO TOP OF CULTECS WITH A CLEAN SAND.
- RESERVE SAS & CONVENTIONAL SAS:
50' X 12' X 0.5' = 444-GPD

CONSTRUCTION NOTES

1. CONTACT OFFICE 48 HOURS+ PRIOR TO START OF THE PROJECT TO SCHEDULE INSPECTIONS.
 2. INSTALLER TO VERIFY SEWER LINE INVERTS PRIOR TO EXCAVATION. THE GALLERY/1-BR BUILDING IS TO HAVE INTERIOR FIXTURES WATER TESTED TO CONFIRM ALL DISCHARGE IS DIRECTED TO THE SEPTIC TANK.
 3. PUMP AND REMOVE THE EXISTING SEPTIC TANK, PUMP CHAMBER AND LEACHING AREA. REMOVE ALL UNSUITABLE SOIL WITHIN FIVE FEET OF THE PROPOSED SAS.
 4. A SOIL INSPECTION OF THE PROPOSED LEACHING AREA IS REQUIRED PRIOR TO PLACEMENT OF TITLE 5 SOIL FILL.
 5. PROVIDE SEWER LINE CLEANOUT CAPS, TO GRADE WITH CONTROL BOX COVERS, BETWEEN THE FOUNDATIONS AND SEPTIC TANK.
 6. ALL ELECTRICAL LINES, TO PUMPS AND EFFLUENT FILTER, ARE TO BE PLACED IN CONDUIT.
 7. SEPTIC TANK OUTLET COVER (CAST IRON RING & COVER) TO BE SET AT GRADE. SEPTIC TANK CENTER PORT AND INLET PORT TO HAVE ACME-SHOREY CONCRETE RINGS WITH 21" COVER. PUMP CHAMBER REQUIRES CAST IRON RING AND COVER SET AT GRADE. PROVIDE SPLASH PLATES BELOW THE LEACHING AREA INLET LINES.
 8. A FINAL INSPECTION IS REQUIRED BY THE HARWICH HEALTH DEPARTMENT AND MORAN ENGINEERING. PUMP CHAMBER REQUIRES BEING WATER TESTED.
 9. REPAIR STONE DRIVEWAY AS REQUIRED. LOAM AND SEED ALL LAWN IMPACT AREAS AND OVER THE THE LEACHING AREA.
- GENERAL NOTES**
1. ALL SYSTEM COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH TITLE 5 OF THE SANITARY CODE AND ANY APPLICABLE REGULATIONS.
 2. PRIOR TO BACK FILLING THE INSTALLATION, THE DESIGNER AND HEALTH AGENT SHALL BE NOTIFIED FOR INSPECTION.
 3. ANY ALTERATIONS OF THIS DESIGN MUST BE APPROVED BY THE DESIGNER AND BOARD OF HEALTH, IN WRITING.
 4. THIS SYSTEM IS NOT DESIGNED FOR A GARBAGE GRINDER.
 5. THE INSTALLER IS TO VERIFY THE LOCATION(S) OF UTILITIES, CESSPOOL(S) AND SEWER INVERTS PRIOR TO CONSTRUCTION.
 6. ALL UNSUITABLE MATERIAL WITHIN 5 FEET IN ALL DIRECTIONS FROM THE SOIL ABSORPTION SYSTEM SHALL BE REMOVED AND REPLACED WITH CLEAN, COARSE SAND.
 7. ALL FILL MATERIAL UTILIZED FOR THE SOIL ABSORPTION SYSTEM SHALL BE CLEAN, COARSE SAND FREE FROM DELETERIOUS MATERIAL AND SHALL HAVE A PERCOLATION RATE OF LESS THAN 2 MINUTES PER INCH BEFORE AND AFTER PLACEMENT.
 8. EXISTING CESSPOOL(S) TO BE PUMPED AND BACK FILLED PER TITLE 5 ABANDONMENT PROCEDURES.
 9. DURING INSTALLATION, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE EXCAVATION AREA.
 10. THE GROUND COVER OVER SEPTIC SYSTEM COMPONENTS SHALL NOT EXCEED 36".
 11. ALL GRAVITY SEWER PIPE SHALL BE 4" DIAMETER SCHEDULE 40 PVC UNLESS OTHERWISE NOTED. THE MINIMUM SLOPE OF 4" DIAMETER SCHEDULE 40 PVC SHALL NOT BE LESS THEN 0.01' PER FOOT.
 12. WHEREVER SEPTIC LINES CROSS WATER SERVICE LINES OR WHEN WATER SERVICE LINES COME WITHIN 10' OF THE PROPOSED SOIL ABSORPTION SYSTEM, PIPES SHALL BE CLASS 150 PRESSURE PIPE AND SHOULD BE PRESSURE TESTED TO ASSURE WATER TIGHTNESS. COORDINATE WITH LOCAL WATER DEPARTMENT.
 13. PLACE MAGNETIC MARKING TAPE OVER ALL COMPONENTS.

MORAN ENGINEERING ASSOCIATES

508-432-2878

941 ROUTE 28, HARWICH, MA

SEPTIC DESIGN PLAN

Prepared For: Susan C Lilley

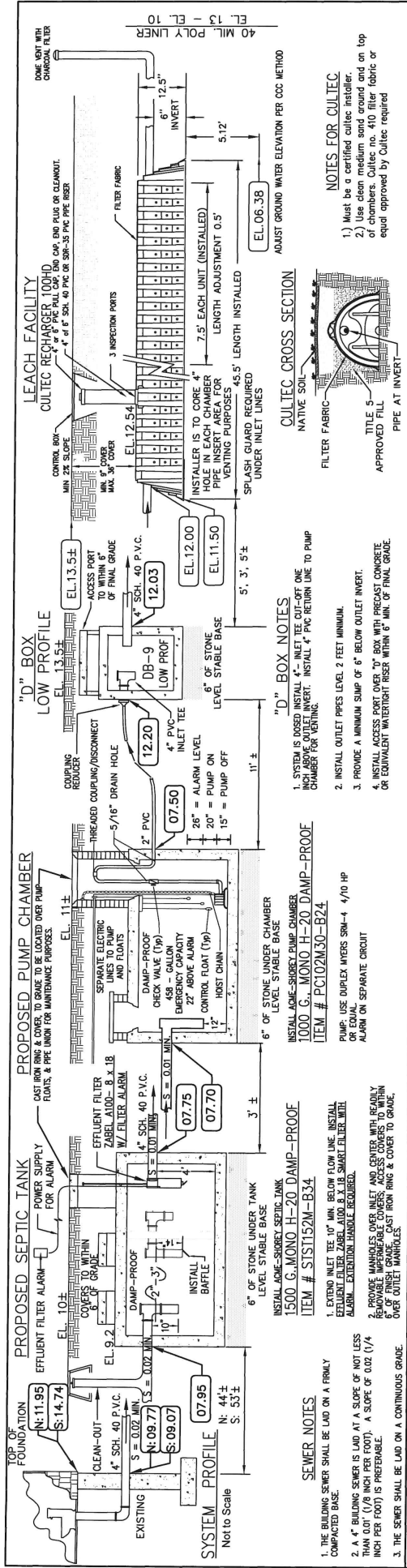
820 ROUTE 28

HARWICH PORT, MA

PROJECT: 23-258

SHEET 2 of 2

DATE: 01/07/25



SEWER NOTES

- 1. THE BUILDING SEWER SHALL BE LAID ON A FIRMLY COMPACTED BASE.
- 2. A 4" BUILDING SEWER IS LAID AT A SLOPE OF NOT LESS THAN 0.01" (1/8 INCH PER FOOT). A SLOPE OF 0.02 (1/4 INCH PER FOOT) IS PREFERABLE.
- 3. THE SEWER SHALL BE LAID ON A CONTINUOUS GRADE.

DEEP OBSERVATION HOLE LOGS

HOLE # 1
TEST BY: RICK JUDD
DATE: 12/24/2024

ELEV.	FROM	HOR.	TEXTURE	COLOR	REDOX.	FEATURES	STRUCTURE
10.80	SURFACE	10"	Ap	Loamy Sand	10 YR 3/2	NO	CONSISTENCY, OTHER
09.97	10"	45"	Bw	Loamy Medium Sand	7.5 YR 4/6	NO	Loose
07.05	45"	104"	C	Coarse Sand	10 YR 6/4	NO	Very Friable
02.13	104"						Loose, Single Grain, Variegated Color
GROUND WATER ENCOUNTERED AT 71". EL. 04.88							
WITNESS: M. BALLINGER, HB08							

ESTIMATED HIGH GROUNDWATER CALCULATION (USGS/CCS METHOD)
DATE OF READING: DECEMBER 2024
INDEX WELL #759-89 ZONE: A
WELL TO GROUNDWATER: 11.70
ACTUAL GROUNDWATER LEVEL AT SITE EL. = 04.88
ESTIMATED (MAX) HIGH GROUNDWATER LEVEL EL. = 06.38

HOLE # 2
TEST BY: RICK JUDD
DATE: 12/24/2024

ELEV.	FROM	HOR.	TEXTURE	COLOR	REDOX.	FEATURES	STRUCTURE
11.10	SURFACE	12"	Ap	Loamy Sand	10 YR 3/2	NO	CONSISTENCY, OTHER
10.10	12"	39"	Bw	Loamy Medium Sand	10 YR 4/6	NO	Loose
07.85	39"	108"	C	Coarse Sand	10 YR 6/4	NO	Very Friable
02.10	108"						Loose, Single Grain, Variegated Color
GROUND WATER ENCOUNTERED AT 77". EL. 04.68							
WITNESS: M. BALLINGER, HB08							

HOLE # 3
TEST BY: RICK JUDD
DATE: 12/24/2024

ELEV.	FROM	HOR.	TEXTURE	COLOR	REDOX.	FEATURES	STRUCTURE
11.60	SURFACE	30"	HTM	Fill			CONSISTENCY, OTHER
10.55	30"	38"	App	Loamy Sand	10 YR 3/2	NO	Granular
10.05	38"	54"	Bwb	Loamy Medium Sand	7.5 YR 4/6	NO	Very Friable
07.63	54"	104"	C	Coarse Sand	10 YR 5/6	NO	Loose, Variegated Color
02.80	104"						Loose, Variegated Color
PERC AT 72" RATE: < 2 MIN / INCH							
LOADING RATE: 0.74 - GPD / SF							
GROUND WATER ENCOUNTERED AT 88". EL. 04.27							
WITNESS: M. BALLINGER, HB08							

HOLE # 4
TEST BY: RICK JUDD
DATE: 12/24/2024

ELEV.	FROM	HOR.	TEXTURE	COLOR	REDOX.	FEATURES	STRUCTURE
11.30	SURFACE	9"	HTM	Fill			CONSISTENCY, OTHER
10.55	9"	15"	App	Loamy Sand	10 YR 3/2	NO	Granular
10.05	15"	44"	Bwb	Loamy Medium Sand	7.5 YR 4/6	NO	Very Friable
07.63	44"	102"	C	Coarse Sand	10 YR 6/4	NO	Loose, Variegated Color
02.80	102"						Loose, Variegated Color
PERC AT 58" RATE: < 2 MIN / INCH							
LOADING RATE: 0.74 - GPD / SF							
GROUND WATER ENCOUNTERED AT 78". EL. 04.80							
WITNESS: M. BALLINGER, HB08							

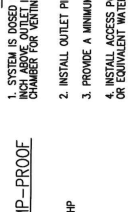
ACME-SHORE 1500 GAL. 2-COMPARTMENT SEPTIC TANK
MONOLITHIC, H-20, DAMP-PROOF
BUOYANCY CALCULATIONS
11.5' X 6.0' X 3.2' = 220.8 CF
220.8 CF X 62.4 UPLIFT = 13,777.9 LBS UPLIFT
13,778 LBS UPLIFT < 25,000 LBS PROVIDED.

ACME-SHORE 1000 GAL. PUMP CHAMBER
MONOLITHIC, H-20, DAMP-PROOF
BUOYANCY CALCULATIONS
7.7' X 6.0' X 3.4' = 157.1 CF
157.1 CF X 62.4 UPLIFT = 9,803 LBS UPLIFT
9,803 LBS UPLIFT < 16,500 LBS PROVIDED.

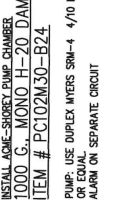
"D" BOX NOTES

- 1. SYSTEM IS DOWSED INSTALL 4" INLET TEE OUT-OF-ONE CHAMBER FOR VENTING.
- 2. INSTALL OUTLET PIPES LEVEL 2 FEET MINIMUM.
- 3. PROVIDE A MINIMUM SUMP OF 6" BELOW OUTLET INVERT.
- 4. INSTALL ACCESS PORT OVER 10" BOX WITH PRECAST CONCRETE OR EQUIVALENT WATERTIGHT RISER WITHIN 6" MIN. OF FINAL GRADE.

"D" BOX PROFILE



"D" BOX CROSS SECTION



- 1) Must be a certified cullec installer.
- 2) Use clean medium sand around and on top of chambers. Cullec no. 410 filter fabric or equal approved by Cullec required