

HOLE #1

DEPTH FROM SURFACE	SOIL MATRIX COLOR	REMARKS	SOIL TEXTURE	ELEVATION
EXISTING GROUND ELEVATION: 279.50				
0-7	FILL			278.92
7-20	Ab	10YR 3/1	SL	277.83
20-32	Bw	10YR 5/3 @ 22" 7.5YR 5/8	SL	276.83 ESHWT 277.67
32-84	C	2.5Y 6/2	SL	272.50

HOLE #2

DEPTH FROM SURFACE	SOIL MATRIX COLOR	REMARKS	SOIL TEXTURE	ELEVATION
EXISTING GROUND ELEVATION: 279.50				
0-3	Ap	10YR 3/2	SL	279.25
3-16	FILL			278.17
16-36	Ab	@ 22" 7.5YR 5/8	SL	276.50 ESHWT 277.67
36-88	C	2.5Y 6/2	SL	272.17

COMPONENT NOTES:

- SEPTIC TANK SHALL BE 1,000/500 GALLON DUAL COMPARTMENT TANK TO BE PLACED LEVEL ON A MINIMUM OF 15,000 TILES OF THE STATE ENVIRONMENTAL CODE.
- THIS DESIGN CONFORMS TO ALL PLAN DESIGN REFERENCES BELOW OBTAINED.
- PERC TEST SHALL BE CONDUCTED UNTIL ALL NECESSARY PERMITS ARE OBTAINED.
- THIS PLAN IS INTENDED FOR THE INSTALLATION OF THE SEWAGE DISPOSAL SYSTEM ONLY. PROPERTY LINES SHALL BE CONSIDERED APPROXIMATE. NO CHANGES SHALL BE MADE TO THE APPROVED PLAN WITHOUT PRIOR APPROVAL OF THE LOCAL APPROVING AUTHORITY AND THE ENGINEER.
- THIS SYSTEM IS NOT DESIGNED FOR THE USE OF A GARBAGE DISPOSAL APPLIANCE AND ARE INTENDED ONLY TO ADVISE THE CONTRACTOR OF THEIR PRESENCE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING THE ACTUAL LOCATION OF ALL EXISTING UTILITIES.
- CALL "DIG SAFE" (1-888-344-7233) FOR FIELD LOCATIONS OF ALL EXISTING UTILITIES.

GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH 310 CMR 15.000, TITLE 5 OF THE STATE ENVIRONMENTAL CODE.
- THIS DESIGN CONFORMS TO ALL PLAN DESIGN REFERENCES BELOW OBTAINED.
- PERC TEST SHALL BE CONDUCTED UNTIL ALL NECESSARY PERMITS ARE OBTAINED.
- THIS PLAN IS INTENDED FOR THE INSTALLATION OF THE SEWAGE DISPOSAL SYSTEM ONLY. PROPERTY LINES SHALL BE CONSIDERED APPROXIMATE. NO CHANGES SHALL BE MADE TO THE APPROVED PLAN WITHOUT PRIOR APPROVAL OF THE LOCAL APPROVING AUTHORITY AND THE ENGINEER.
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- CALL "DIG SAFE" (1-888-344-7233) FOR FIELD LOCATIONS OF ALL EXISTING UTILITIES.

**SEWAGE DISPOSAL SYSTEM
18 MIDDLESEX DRIVE
LITTLETON, MA
TOM MACDOWELL**

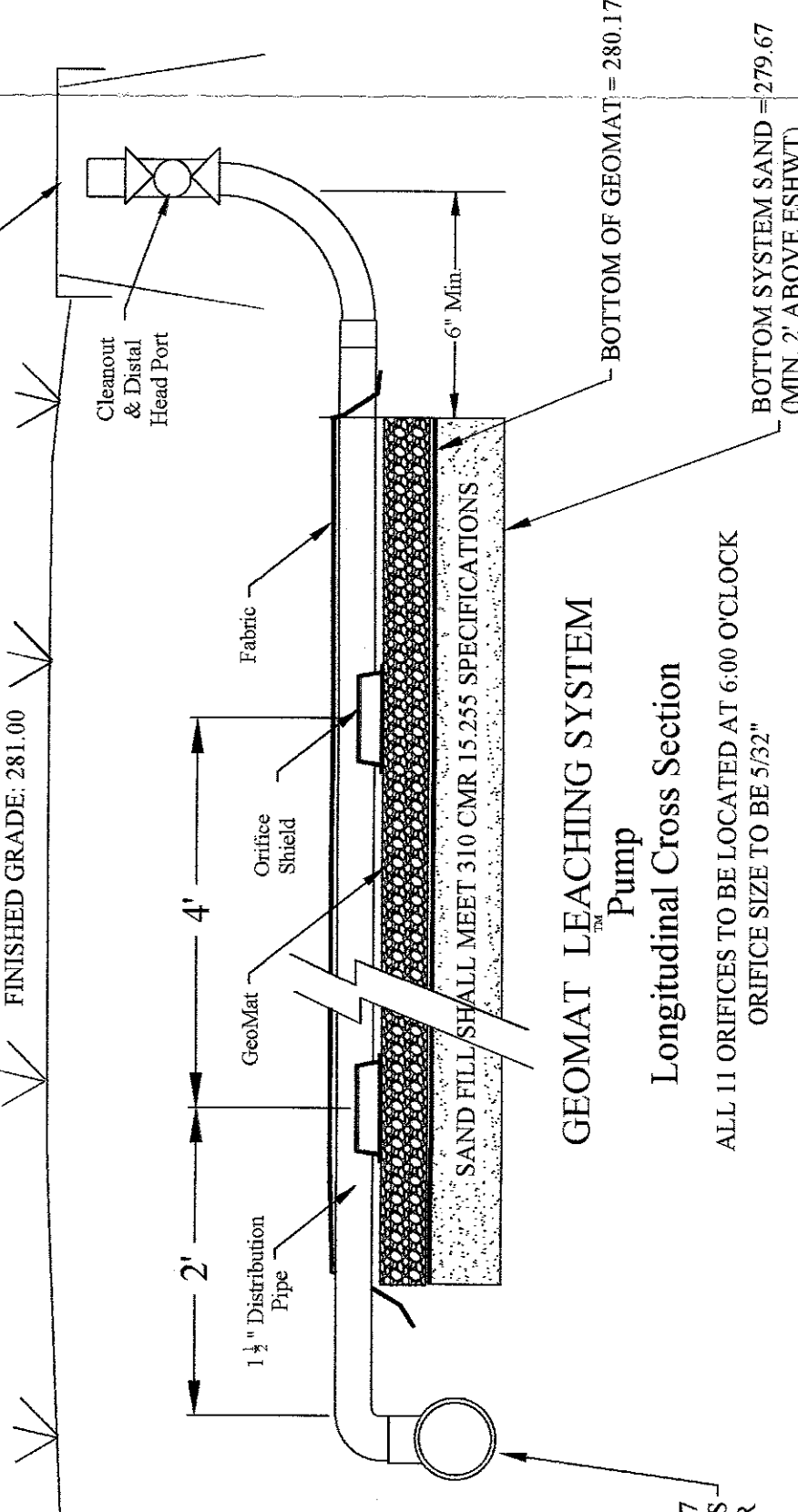
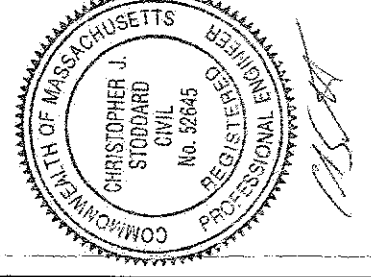
STODDARD ENGINEERING
186 OLD KEENE ROAD
ATHOL, MASSACHUSETTS 01331
978.790.9731
Stoddard46@gmail.com

DATE: 9/15/2023

SCALE: 1" = 20'

DRAWN BY: CIS

SHEET 1 OF 1



BUOYANCY CALCULATIONS:

GIVEN:
 NET WEIGHT OF TANK = 8,765 lbs (Shea Concrete 1,000 Gal)
 NET DENSITY OF SOIL = 105 lb/cu ft
 DRY DENSITY OF WATER = 62.4 lb/cu ft
 TOP OF TANK ELEV. = 279.76
 FINAL GRADE ELEV. = 280.50
 BOTTOM OF TANK ELEV. = 274.10
 GROUNDWATER ELEV. = 277.67
 A1- HORIZONTAL AREA OF TANK FOR Fb = 41.33sq ft
 Fw = WEIGHT OF TANK PLUS WEIGHT OF SOIL
 Fb = BUOYANCY FORCE

PROVE:

Fw > Fb
 Fw = 8,765 lbs + (41.33 sq ft)(105 lb/cu ft)(0.74 ft)
 Fb = (277.67-274.10)(41.33 sq ft)(62.4 lb/cu ft)
 Fw > Fb

DESIGN CRITERIA:

DESIGN FLOW:
 3 BEDROOMS @ 110 GPD/BDRM = 330 GPD

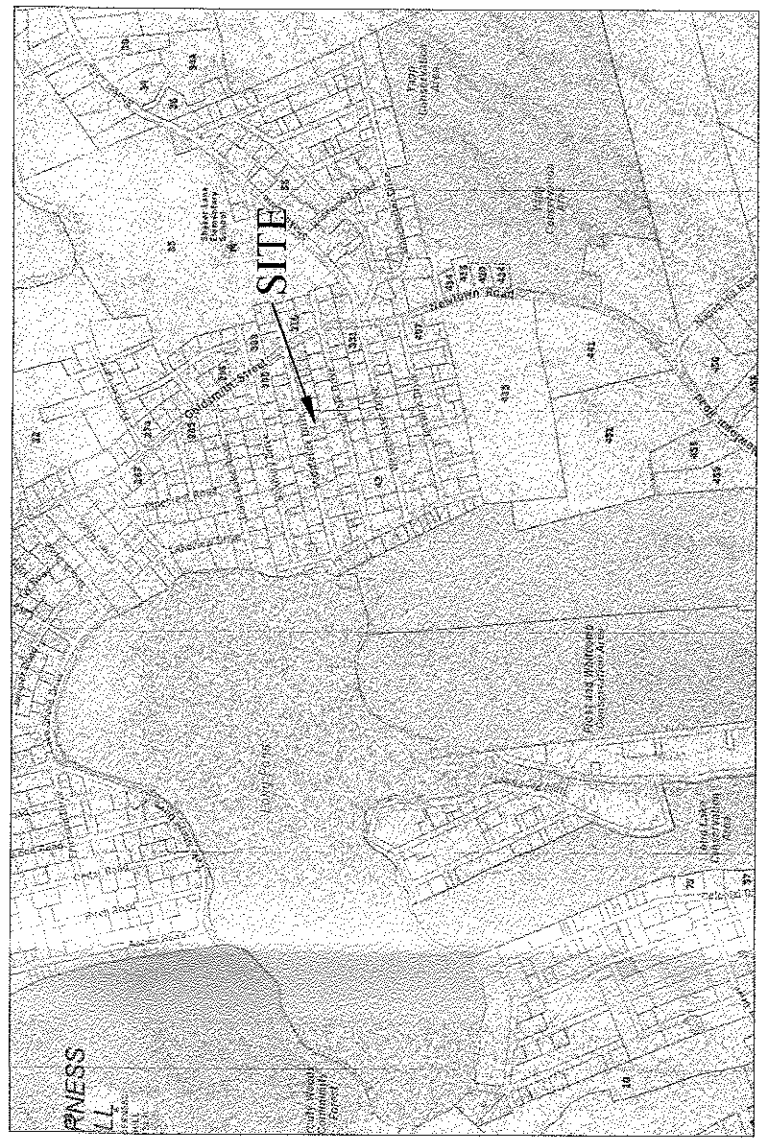
DESIGN NOTES:

- LTAR (CLASS ID) = 0.67 GPD/SF AS STATED IN TABLE 1 OF MASSACHUSETTS DESIGN MANUAL
- MINIMUM SOFT OF GEOMAT REQUIRED - 3 BEDROOM @ 110 gpd = 363 sq ft OF GEOMAT REQUIRED
- LENGTH OF GEOMAT FLAT 2400' 493 SQFT / (1.17 SQFT/LIN FT) = 227 LIN FT
- MINIMUM SAND BED SIZE FROM TABLE 3 = 400 SQFT
- GEOMAT LAYOUT: 5 - 46' ROWS = 230 LIN FT
- MINIMUM BED LENGTH 46' + 1' + 1' = 48'
- MINIMUM BED LENGTH (5 x 2) + (4 x 4') + 1' + 1' = 13.67'
- TOTAL SAND BED SIZE: 48' x 11.5' = 552 SQFT

TANK REQUIREMENT:

330 GPD x 200% = 660 GAL MINIMUM
 TWO COMPARTMENT 1000/500 GALLON TANK WITH DEP APPROVED EFFLUENT FILTER AND GAS BAFFLE PROVIDED AND A 1000 GALLON PUMP CHAMBER TO BE PROVIDED

LOCUS
SCALE
1" = 1000'

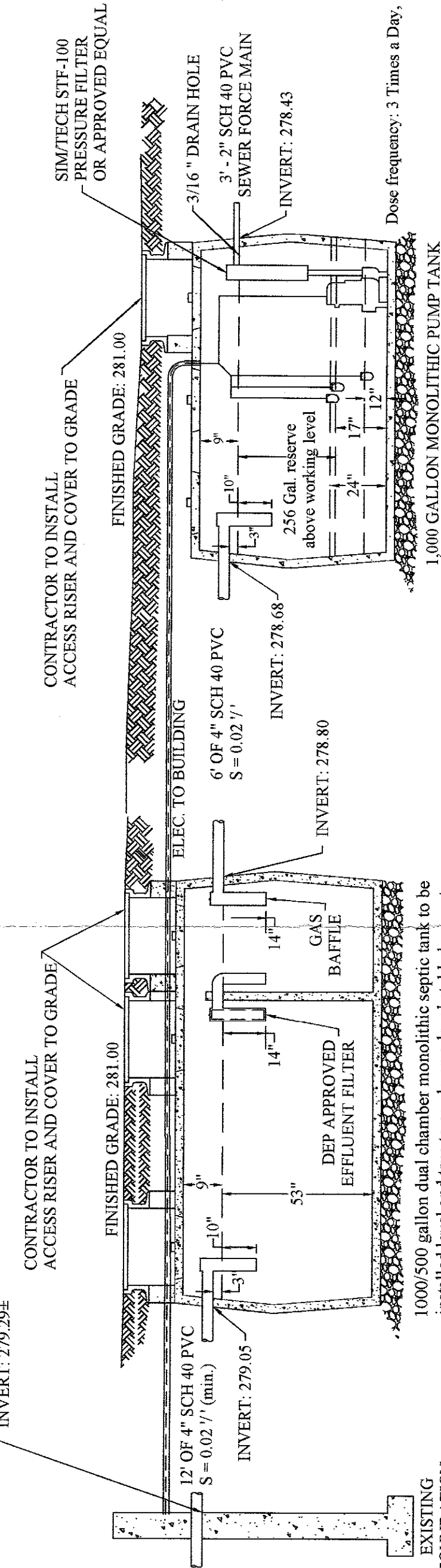


LOCAL UPGRADE APPROVAL:

- 310 CMR 15.212 REQUEST REDUCTION IN THE GROUNDWATER OFFSET FROM FOUR FEET TO TWO FEET IN ACCORDANCE WITH GEMAT LEACHING SYSTEM MASSACHUSETTS DESIGN AND INSTALLATION MANUAL AND THE MASSDEP REMEDIAL APPROVAL
- 310 CMR 15.405 (06): USE OF SIEVE ANALYSIS IN SUBSTITUTION OF PERCOLATION TEST (PAR 15.211 (1)) REQUEST REDUCTION IN DISTANCE OF SAS FROM CRAWL SPACE WALL FROM 10' TO 5'

PLAN DESIGN REFERENCES:

- 310 CMR 15.000 - THE STATE ENVIRONMENTAL CODE, TITLE 5. STANDARD REQUIREMENTS FOR THE SITING, CONSTRUCTION, INSPECTION, UPGRADE AND EXPANSION OF ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS AND FOR THE TRANSPORT AND DISPOSAL OF SEPTAGE
- STANDARD CONDITIONS FOR ALTERNATIVE SOIL ABSORPTION SYSTEMS WITH GENERAL USE APPLICATION AND/OR APPROVED FOR REMEDIAL USE, AUGUST 14, 2019
- MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL AFFAIRS, SOIL ABSORPTION SYSTEMS DESIGN MANUAL, AUGUST 2016
- GEOMAT LEACHING SYSTEMS DESIGN MANUAL FOR PRESSURE AND GRAVITY APPLICATIONS, AUGUST 2016



SOIL EVALUATION:

SOIL EVALUATOR: CHRISTOPHER STODDARD, P.E.
 WITNESS: JIM GARRETT
 DATE: 7-28-2023

PERC TEST RESULTS:

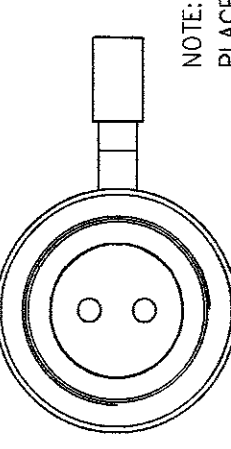
SOIL WAS TO SATURATED TO CONDUCT PERC TEST. SOIL SAMPLE TAKEN FROM "C2" HORIZON OF DH#1

FLOW EQUALIZATION PROCEDURE:

- INSTALL CLEAR PIPE TO ADAPTER.
- OPEN ALL VALVES.
- TURN ON PUMP AND NOTE ELEVATION OF WATER IN EACH VALVE HEIGHT FOR EACH WITH GATE VALVE AT START OF LATERAL.
- AFTER EQUALIZATION, TURN PIPES, CLOSE VALVES AND REINSTALL CAPS.

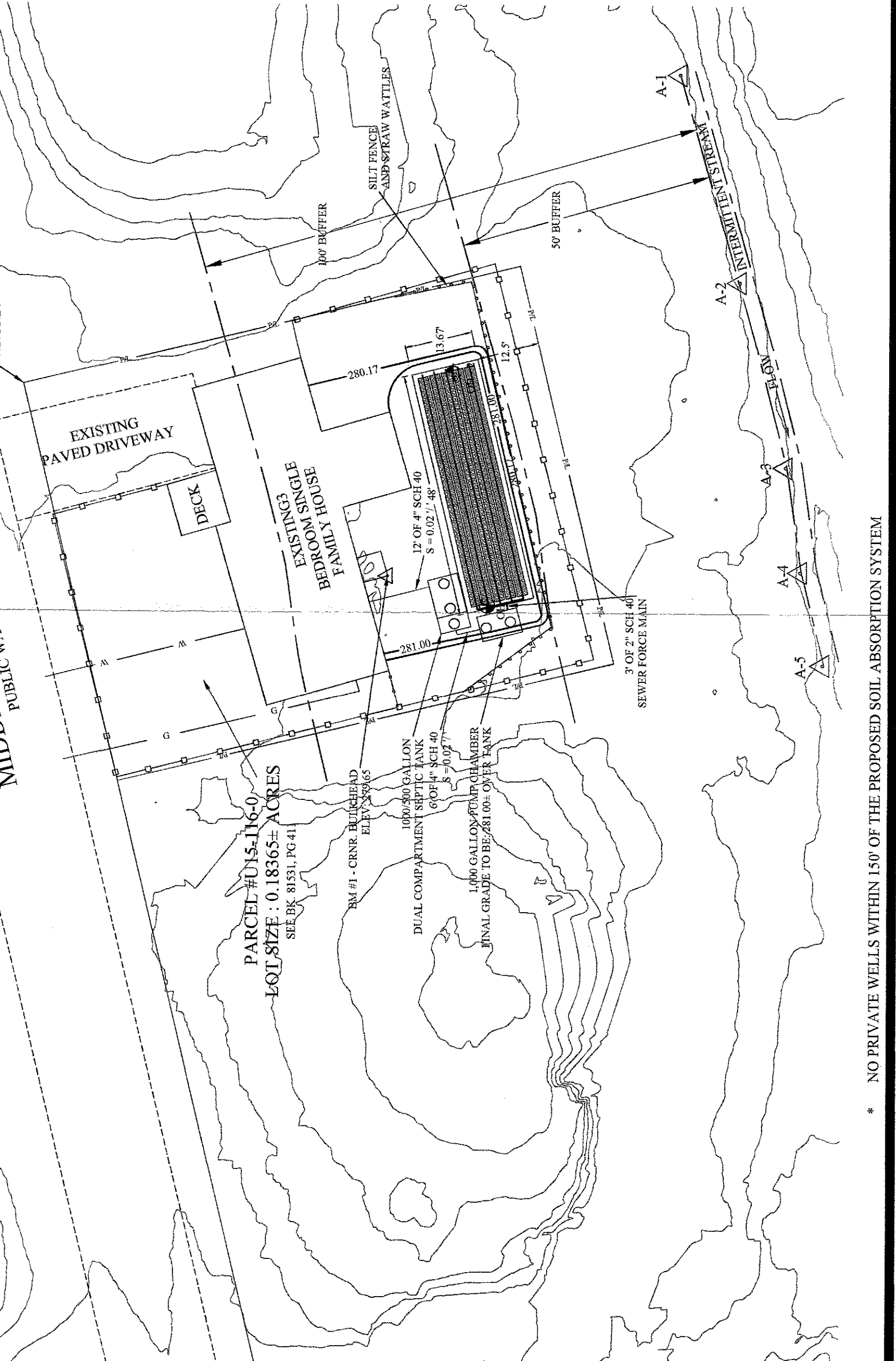


NOTE:
 PLACE DISTAL PORT ASSEMBLY AT END OF MAINFOLD FOR FLUSHING



PUMP SELECTION FOR A GEOMAT SYSTEM

Model	Flow (GPD)	Head (ft)	Power (W)
1000/500	330	10	100
1500/750	495	15	150
2000/1000	660	20	200
2500/1250	825	25	250
3000/1500	990	30	300
3500/1750	1155	35	350
4000/2000	1320	40	400
4500/2250	1485	45	450
5000/2500	1650	50	500
5500/2750	1815	55	550
6000/3000	1980	60	600
6500/3250	2145	65	650
7000/3500	2310	70	700
7500/3750	2475	75	750
8000/4000	2640	80	800
8500/4250	2805	85	850
9000/4500	2970	90	900
9500/4750	3135	95	950
10000/5000	3300	100	1000



* NO PRIVATE WELLS WITHIN 150' OF THE PROPOSED SOIL ABSORPTION SYSTEM