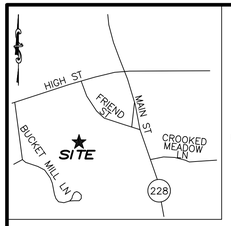


VICINITY MAP
NO SCALE

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

SOIL TEST DATA

SOIL TESTING AND EVALUATION BY: JAMES GARFIELD, DEP SE#14162
SOIL TESTING WITNESSED BY: BETTY NEE
DATE: AUGUST 26, 2020

TP–A	APPROX. GRADE EL. 37.2	
	A HORIZON LOAMY SAND 10YR 3/2	
EL. 36.5		9"
	B HORIZON LOAMY SAND 10YR 5/6	
EL. 35.9		16"
	C HORIZON M/C SAND 2.5Y 5/4	
EL. 27.2		120"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: NONE
PERC. RATE: <2 MPI @ 28–46"
ESHGW: FRIMPTER ADJUSTMENT (EL. 30.6)

TP–B	APPROX. GRADE EL. 37.7	
	A HORIZON LOAMY SAND 10YR 3/2	
EL. 37.0		8"
	B HORIZON LOAMY SAND 10YR 5/6	
EL. 36.5		15"
	C HORIZON M/C SAND 2.5Y 5/4	
EL. 27.7		120"

WEEPING OBSERVED: NONE
MOTTLING OBSERVED: NONE
PERC. RATE: NONE
ESHGW: SEE TP–1

FRIMPTER ADJUSTMENT

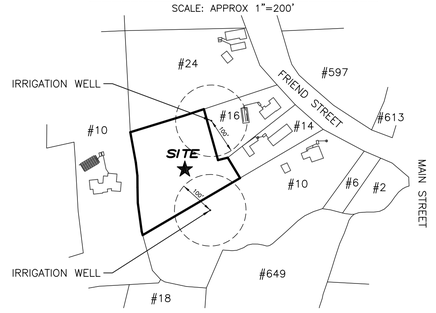
Use Duxbury Well No. 79 Comparison
Sc = 120" = 10' (Bottom of TP–1)
Sr = 4.2 USGS (Frimpter) Report (range at 5%, Figure 12)
Owc = 9.17 Depth in Well No. 79 (July 28, 2020)
Ow max = 5.86 Current Conditions (Table 1) upper limit
Owr = Upper Limit of Annual Range = 4.11
Sh = Sc – Sr{(Owc–Ow max)/Owr}
Sh = 10.0 – 4.2{(9.17–5.86)/4.11} = 6.6' (Adjusted Water Level Below Grade TP–1)
ESHGW = 37.2 – 6.6 = 30.6 (TP–1)

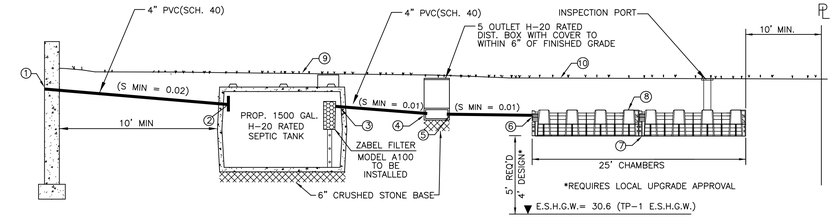
TABLE OF AREAS WITHIN 100' WETLAND BUFFER

	EXIST.	PROP.
LOT AREA	59,765 S.F.	NO CHANGE
LAWN AREA	20,870 S.F.	20,509 S.F.
WOODLAND AREA	37,080 S.F.	NO CHANGE
ROOF AREA	192 S.F.	1,634 S.F.
DECK AREA	257 S.F.	144 S.F.
GRAVEL AREA	1,366 S.F.	398 S.F.

ABUTTING SEPTIC SYSTEMS & WELLS

SCALE: APPROX 1"=200'

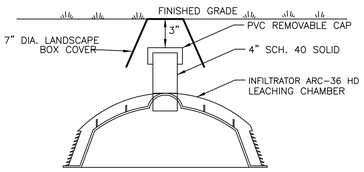




SCHEDULE OF ELEVATIONS

1. INV. OF PIPE AT FOUNDATION = 36.5± (CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION)	6. INV. OF 4" PIPE AT CHAMBER INLET = 35.19
2. INV. OF PIPE AT SEPTIC TANK INLET = 35.72	7. BOTTOM OF CHAMBER = 34.60
3. INV. OF PIPE AT SEPTIC TANK OUTLET = 35.47	8. TOP OF CHAMBER (BREAKOUT) = 35.68
4. INV. OF PIPE AT DIST. BOX INLET = 35.42	9. FINISHED GRADE OVER SEPTIC TANK = 37.5 (MIN) – 39.7(MAX)
5. INV. OF PIPE AT DIST. BOX OUTLET = 35.25	10. FINISHED GRADE OVER LEACHING CHAMBERS = 37.2(MIN) – 38.7(MAX)

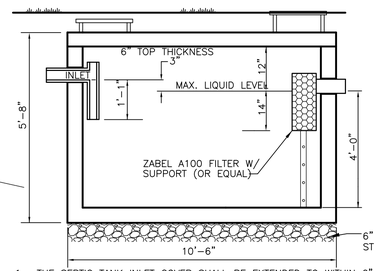
INSPECTION PORT



SEPTIC LAYOUT

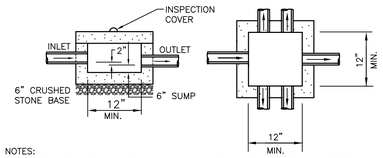
SCALE: 1" = 20'

1,500 GAL. H–20 RATED SEPTIC TANK DETAIL



1. THE SEPTIC TANK INLET COVER SHALL BE EXTENDED TO WITHIN 6" OF FINISHED GRADE. THE SEPTIC TANK OUTLET COVER SHALL BE EXTENDED TO FINISHED GRADE.
2. ALL PIPE CONNECTION AND CONSTRUCTION JOINTS SHALL BE SEALED WITH HYDRAULIC CEMENT.
3. SEPTIC TANK SHALL BE INSTALLED ON A LEVEL 6" CRUSHED STONE BASE.
4. OUTLET SHALL BE EQUIPPED WITH A ZABEL A100 EFFLUENT FILTER (OR APPROVED EQUAL).

5 OUTLET H–20 RATED DISTRIBUTION BOX



NOTES:
1. DISTRIBUTION BOX COVER SHALL BE EQUIPPED WITH RISERS AS NECESSARY TO BRING THE COVER TO WITHIN 6" OF FINISHED GRADE.
2. ALL PIPE CONNECTION AND CONSTRUCTION JOINTS SHALL BE SEALED WITH HYDRAULIC CEMENT.
3. DISTRIBUTION BOX TO BE INSTALLED ON A LEVEL 6" CRUSHED STONE BASE.
4. THE FIRST 2 FT. OF PIPE EXITING THE DISTRIBUTION BOX SHALL BE INSTALLED LEVEL.

HINGHAM BOARD OF HEALTH SUPPLEMENTARY RULES & REGULATIONS FOR THE DISPOSAL OF SANITARY SEWAGE

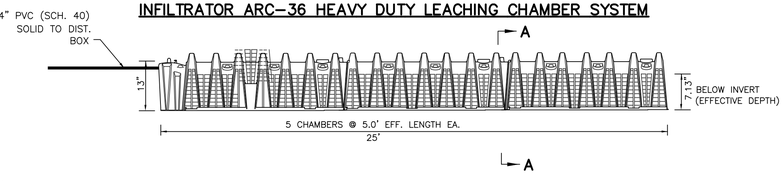
SECTION VII.J: TO ALLOW A REDUCTION FROM 6' (REQ'D) TO 5.3' (PROP.) BETWEEN THE BOTTOM OF THE LEACHING FACILITY AND THE MAXIMUM GROUNDWATER ELEVATION.

SECTION VII.M(1): TO ALLOW A REDUCTION FROM 6' (REQ'D) TO 5.3' (PROP.) OF NATURALLY OCCURING PERVIOUS STRATA ABOVE THE MAXIMUM GROUNDWATER ELEVATION.

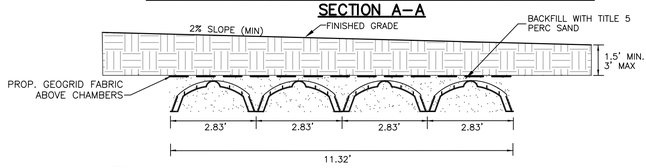
LOCAL UPGRADE APPROVAL REQUESTS

310 CMR 15.405(h): TO ALLOW A REDUCTION FROM 5'(REQ'D) TO 4'(PROP.) BETWEEN GROUNDWATER AND THE BOTTOM OF THE SAS.

INFILTRATOR ARC–36 HEAVY DUTY LEACHING CHAMBER SYSTEM



INFILTRATOR ARC 36 HEAVY DUTY LEACHING CHAMBERS SECTION A–A



NOTES :
1.) NO STONE BELOW OR AROUND CHAMBERS IS REQUIRED.
2.) BACKFILL CHAMBERS WITH CLEAN COARSE SAND IN ACCORDANCE WITH 310 CMR 15.255 (3) TO THE TOP OF THE CHAMBER.
3.) DO NOT BACKFILL WITH ANY STONES 3" OR LARGER AGAINST CHAMBERS.
4.) CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

ZONING: RESIDENCE B

	REQ'D
MIN. LOT AREA:	30,000 S.F.
FRONTAGE (FT.)	150'
FRONT YARD SETBACK (FT.)	35'
SIDE YARD SETBACK (FT.)	20'
REAR YARD SETBACK (FT.)	20'
BUILDING HEIGHT (STORIES)	2.5
BUILDING HEIGHT (FEET)	35'

DESIGN DATA

1. BUILDING TYPE: RESIDENTIAL
2. NO. OF BEDROOMS: 3 (DESIGN), 2 (PROPOSED)
3. DESIGN FLOW: 3 BEDROOMS x 110 G.P.D./BED = 330 G.P.D.
4. DESIGN PERCOLATION RATE: <2 MPI (TP–1)
5. GARBAGE DISPOSAL: NO
6. SEPTIC TANK DESIGN REQUIREMENT: 200% DESIGN FLOW 330 X 2 = 660 GAL. (USE 1500 GAL. SEPTIC TANK)
7. LEACH AREA REQUIREMENTS GALLONS/SQ. FT. (CLASS I SOILS) BOTTOM: 0.74 GAL./S.F. SIDE: 0.74 GAL./S.F.
8. TOTAL LEACH AREA REQUIRED: TITLE 5: 330 GPD / (0.74 GPD/S.F.) = 445.9 S.F.
   PROVIDED: 4 ROWS OF 5 INFILTRATOR ARC–36 HEAVY DUTY LEACHING CHAMBERS 20 CHAMBERS x 5'L (EA.) x 4.8 S.F./L.F.* = 480 S.F.
   CAPACITY: 480 S.F. x 0.74 GPD/S.F. = 355.2 GPD
   *EFFECTIVE AREA PER GENERAL USE CERTIFICATION ISSUED BY DEP.

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 LIES ENTIRELY WITHIN A DEP DESIGNATED ZONE II AREA.
2. ALL KNOWN WETLANDS WITHIN 100 FEET OF THE PROPOSED SEWAGE SYSTEM ARE SHOWN.
3. PROPERTY LINE DATA WAS OBTAINED FROM RECORDED DEED (BK. 32200 PG. 161) AND RECORDED PLANS ON FILE AT THE PLYMOUTH COUNTY REGISTRY OF DEEDS
4. ALL RECORDED WELLS OBSERVED WITHIN 500–FT. OF THE PROPOSED SYSTEM ARE SHOWN.
5. LOCUS LIES IN FEMA FLOOD ZONE "X" AND ZONE "AE" (EL. 31.8) AS SHOWN ON FEMA COMMUNITY MAP PANEL 25023C 0084J DATED JULY 17, 2012.
6. ALL KNOWN EASEMENTS ON THE SUBJECT PROPERTY ARE SHOWN.
7. ALL KNOWN ABUTTING SEPTIC SYSTEMS TO THE PROPOSED SYSTEM ARE SHOWN.

COMMONWEALTH OF MASSACHUSETTS
JEFFREY M. HASSETT
CIVIL
No.49293
REGISTERED PROFESSIONAL ENGINEER

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

PROJECT:	14R & 16R FRIEND STREET ASSESSOR'S PARCELS: 117-0-46 & 117-0-45 HINGHAM, MASSACHUSETTS
APPLICANT:	FERDINAND C. LUCAS 30 SUMMER STREET HINGHAM, MA 02043
PLAN TITLE:	SITE & SEPTIC DESIGN PLAN

DESIGN:	JDG
CHECK:	JMH
JOB NO:	20–265
DATE:	8/27/2020
REV:	9/15/2020
SHEET:	1