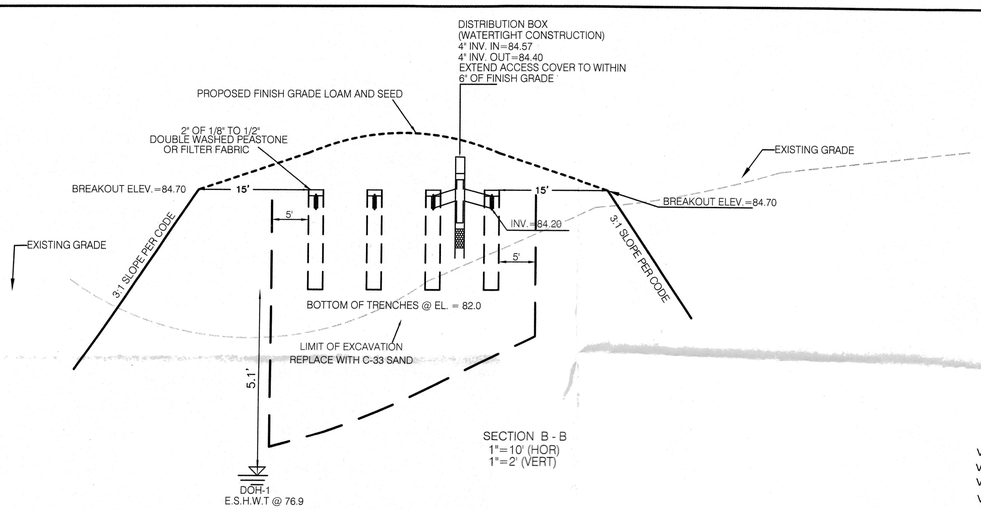
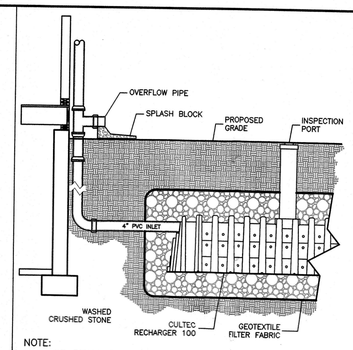


SECTION B - B
1"=10' (HOR)
1"=2' (VERT)

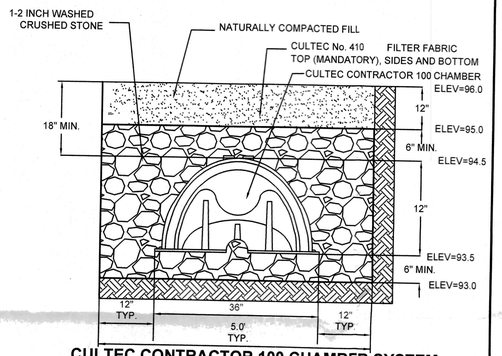
BASE ELEV.=75.0'



NOTE:
CULTECS SHALL BE INSTALLED A MINIMUM OF 10' FROM HOUSE.

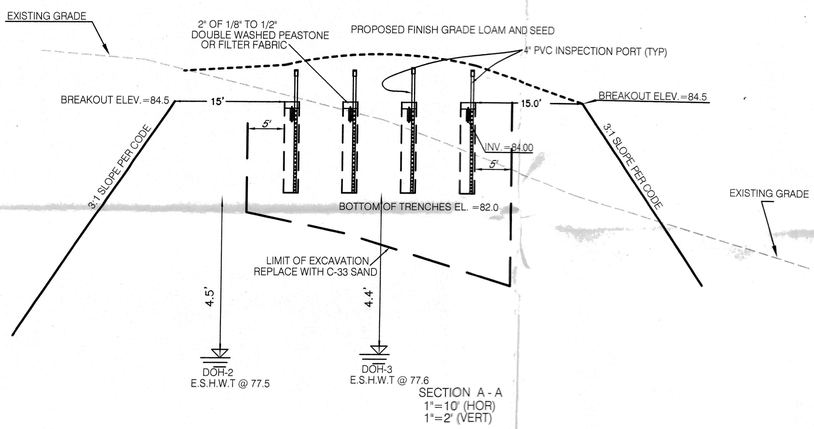
ROOF DRAIN TO CULTEC
NOT TO SCALE

VOLUME = 14 C.F./ UNIT
VOLUME STONE = ((27.33'x5'x2')-(14 C.F.x4))x0.40 = 86.92 C.F.
VOLUME REQUIRED = .6/12 x 2772 s.f. = 138.6 C.F.
VOLUME PROVIDED = 4 UNITS = 56 C.F. + 86.92 C.F.= 142.9 C.F.



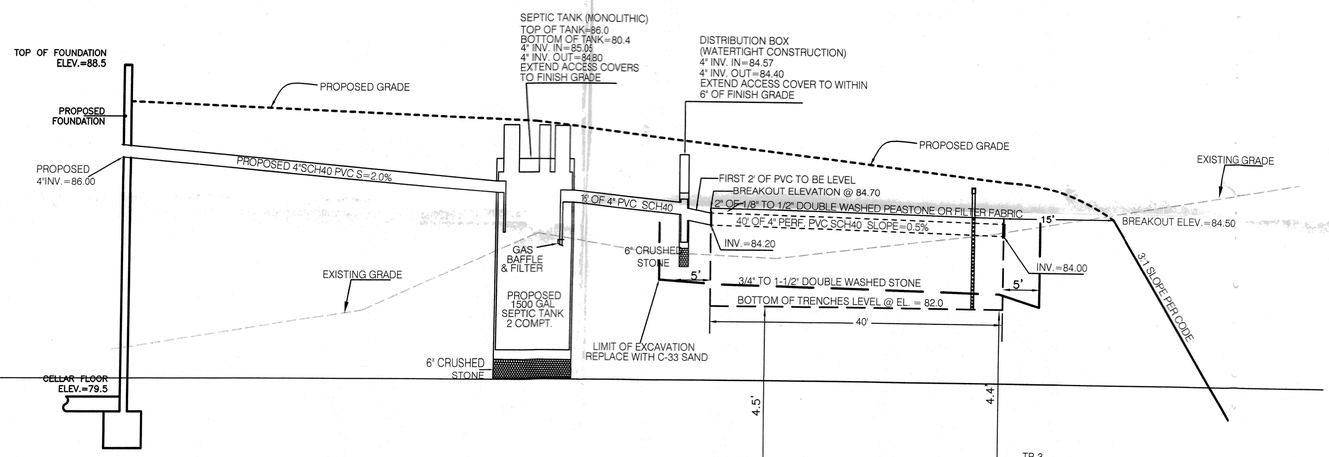
CULTEC CONTRACTOR 100 CHAMBER SYSTEM
NON-TRAFFIC APPLICATION
TYPICAL CROSS SECTION DETAIL

ESTIMATED GROUND WATER ELEV=90.0



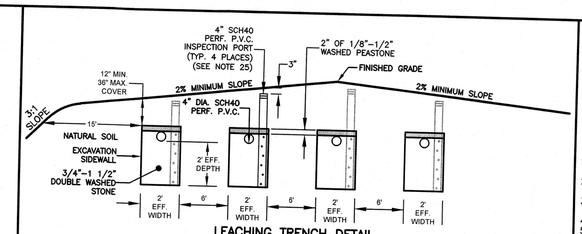
SECTION A - A
1"=10' (HOR)
1"=2' (VERT)

BASE ELEV.=75.0'

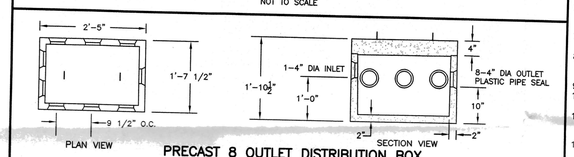


SYSTEM PROFILE
SCALE: 1" = 10' (HOR)
1" = 2 (VERT)

BASE ELEV.=75.0'

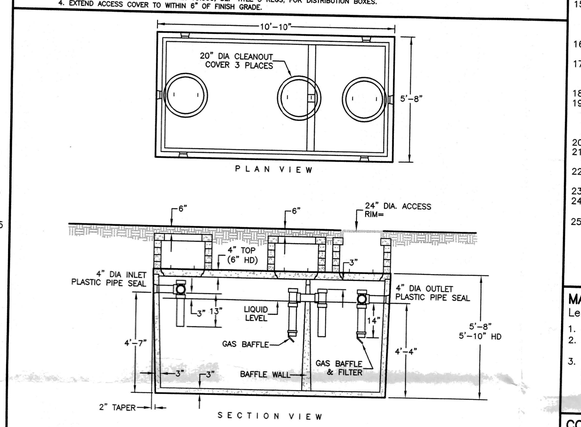


LEACHING TRENCH DETAIL
NOT TO SCALE



PRECAST 8 OUTLET DISTRIBUTION BOX
NOT TO SCALE

NOTES:
1. SHEA CONCRETE ITEM NO. B-6088 SHOWN. EQUIVALENT PRODUCT MAY BE SUBSTITUTED.
2. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
3. DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS. FOR DISTRIBUTION BOXES.
4. EXTEND ACCESS COVER TO WITHIN 6" OF FINISH GRADE.



PRECAST 1500 GALLON MONOLITHIC SEPTIC TANK
NOT TO SCALE

NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS.
3. ALL REINFORCEMENT PER ASTM C1227-93.
4. BAFFLE WALL OPTIONAL FOR TWO COMPARTMENT TANKS.
5. TEES AND GAS BAFFLE SOLD SEPARATELY.
6. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.
7. ALSO AVAILABLE IN H-20 LOADING.
8. TANK TO BE SET ON 6" OF 3/4" TO 1-1/2" CRUSHED STONE.
9. EQUIVALENT PRODUCT MAY BE SUBSTITUTED.
10. EXTEND ACCESS COVER TO WITHIN 6" OF FINISH GRADE AT INLET END. EXTEND ACCESS COVER TO GRADE AT OULET END.

SOIL LOGS

DEPTH (in.)	SOIL HORIZON/ LAYER	SOIL MATRIX: COLOR-MOIST (MUNSELL)	REDOXIMORPHIC FEATURES (MOTTLES) DEPTH	COLOR	PERCENT	SOIL TEXTURE (USDA)	COARSE FRAGMENTS % BY VOLUME GRAVEL	COBBLES & STONES	SOIL STRUCTURE	SOIL CONSISTENCE (MOIST)
DEEP HOLE NUMBER: TP-1							**ELEVATION=81.8'**			
00"-13"	Ap	10YR 3/2				fsl	0	0/0	gr	mfr
13"-35"	Bw	10YR 5/6				fsl	0	0/0	m	mfr
35"-116"	C	2.5Y 5/4	58"	10YR 6/8		ls	0	0/0	m	mfr
				5Y 7/2						Roots to 60"
NO REFUSAL; STATIC WATER 96" DOWN; WEEPING 70" DOWN										
ESTIMATED SEASONAL HIGH GROUNDWATER TABLE DOWN 58" AT ELEVATION = 76.9'										
DEEP HOLE NUMBER: TP-2							**ELEVATION=84.4'**			
00"-08"	Ap	10YR 3/2				fsl			gr	mfr
08"-24"	Bw	10YR 5/6				fsl			m	mfr
24"-100"	C	2.5Y 6/4	82"	10YR 6/8		ls			m	mfr
				2.5Y 7/2						Roots to 72"
NO REFUSAL; NO STATIC WATER; NO WEEPING										
ESTIMATED SEASONAL HIGH GROUNDWATER TABLE DOWN 82" AT ELEVATION = 77.5'										
DEEP HOLE NUMBER: TP-3							**ELEVATION=82.8'**			
00"-12"	Ap	10YR 3/2				fsl			gr	mfr
12"-32"	Bw	10YR 5/6				fsl			m	mfr
32"-96"	c	2.ry 6/4	62"	10YR 6/8		LS			m	mfr
				2.5y 7/2						
NO REFUSAL; NO STATIC WATER; NO WEEPING										
ESTIMATED SEASONAL HIGH GROUNDWATER TABLE DOWN 62" AT ELEVATION = 77.6'										

LEACHING AREA CALCULATIONS:

BOTTOM: (2'W)(40'L) = 80 S.F.
SIDES: (2)(2'D)(40'L) = 160 S.F.
LEACHING AREA PER TRENCH = 240 S.F.

TOTAL LEACH AREA PROVIDED:
(4 TRENCHES)(240 S.F./TRENCH) = 960 S.F.

DESIGN DATA:

NUMBER OF BEDROOMS: 5
DESIGN FLOW: 110 G.P.D./B.R.
DAILY FLOW: 5 x 110 = 550 G.P.D.
SEPTIC TANK REQUIRED: 550 GAL.x2=1100 GAL.
SEPTIC TANK USED: 1500 GAL. 2 COMPARTMENT
LEACH AREA REQUIRED:
CLASS II SOILS LTAR = 0.60 G.P.D./S.F.
550 G.P.D./ 0.60 G.P.D./S.F. =917 S.F.

LEACH AREA USED: 960 S.F.
NO GARBAGE DISPOSALS ALLOWED

GENERAL NOTES:

HAYES ENGINEERING, INC. HAS BEEN RETAINED TO FURNISH A SEPTIC SYSTEM DESIGN PLAN TO THE CLIENT BUT HAS NOT BEEN RETAINED TO CONSTRUCT OR SUPERVISE CONSTRUCTION OF THE SYSTEM.

IN VIEW OF SAME, NO GUARANTEE OR WARRANTY, EXPRESS OR IMPLIED, IS MADE TO THE CLIENT OR TO THE ULTIMATE USER RELATIVE TO ANY SYSTEM INSTALLED PURSUANT TO THE PLAN.

HAYES ENGINEERING, INC. DOES REPRESENT THAT THE PLAN MEETS THE REQUIREMENTS OF THE STATE CODE, TITLE 5, EXCEPT WHERE VARIANCES ARE NOTED.

1. The general contractor is responsible for horizontal and vertical control of all system components.
2. This plan shows the design of the subsurface sewage disposal system only. The system is designed for flows estimated under design criteria.
3. System is designed only to accommodate sanitary sewage associated with normal domestic usage and consisting of water-carried putrescible waste.
4. The system is not designed for garbage grinders.
5. The system shall be vented through building plumbing as required by building code.
6. Property lines and building locations are graphic only. Property lines not having been verified, no representation as to the accuracy or certification of those shown is implied or intended.
7. Applicable zoning by-laws or other local regulations shall be confirmed by the owner prior to construction.
8. The plan shows only those features that were visually apparent on the date of topography and the absence of subsurface structures, utilities, etc. does not mean that they do not exist.
9. The installer of this system must be licensed by the local board of health.
10. There are no existing wells within 100 feet of the proposed sewage disposal system, to the best of our knowledge, unless otherwise indicated.
11. Disposal system areas are to be raked (scarified) before installation of stone. All stones exceeding 2 inches in diameter and all foreign material encountered during excavation are to be removed from the leaching area bed surface.
12. Finished surface of the leaching area shall be graded to assure water runoff (2% minimum slope).
13. All disturbed areas to be loamed, seeded, and maintained to prevent erosion.
14. The septic tank shall be periodically inspected and maintained and should be pumped when sludge in the bottom exceeds 1/4 of the depth.
15. Alternate manufacturers for concrete structures and equipment shown on these plans may be used upon the written approval of the design engineer. Alternate manufacturers will not be used if the use of their equipment requires design changes.
16. If any part of this design is to be altered in any way, the design engineer as well as the approving authorities shall be notified in writing before construction.
17. All work is to comply with the Commonwealth of Massachusetts Department of Environmental Protection State Sanitary Code, title 5 and any local board of health supplementary regulations.
18. The local board of health agent will conduct periodic inspections as needed.
19. These plans and specifications are intended to be explanatory of the work to be done and of each other, but should any omission, errors, or discrepancies appear, they shall be subject to correction and interpretation by the design engineer thereby defining and fulfilling the intent of the plans.
20. Contractor to notify engineer of any site condition differing from those indicated.
21. All work and materials shall conform to the applicable sections of Title 5 of the State Environmental Code.
22. Designer to submit an as-built plan of system within two weeks from final inspection.
23. General contractor to check between benchmarks shown on this plan.
24. All system components shall be marked with magnetic marking tape or a comparable means in order to locate them once buried.
25. The soil absorption system shall have a minimum of one (1) inspection port consisting of a perforated four (4) inch pipe placed vertically down into the stone to the naturally occurring soil or sand fill below the stone. The pipe shall be capped with a screw type cap and accessible to within three (3) inches of finish grade.

MATERIAL NOTES:

Leach Bedding:

1. Clean double washed stone shall be free of iron particles, fines and dust in place.
2. Bottom stone in leach area shall be 3/4" to 1-1/2" double washed stone as indicated in note 1 above.
3. Top stone in leach area shall be 1/8" to 1/2" double washed peastone as indicated in note 1 above. Geotextile fabric may be substituted for the minimum 2 inch layer of double washed peastone.

CONSTRUCTION NOTES:

1. Excavate all topsoil, subsoil, and any other unsuitable material within the limits of excavation and replace to top of peastone elevation with select on-site or imported soil material, consisting of clean granular sand, free from organic matter and deleterious substances.
2. Fill material shall not contain any material larger than two (2) inches. The fill material shall comply with Title 5, State Environmental Code 310 CMR 15.255 (3) as revised.
3. Contractor to supply to the town a current sieve test analyses report at their own expense if required by the local approving authority.

DESCRIPTION OF HORIZONS

TEXTURE					
gravel	g	gravelly sandy loam	gsl		
very coarse sand	vcos	loam	l		
coarse sand	cos	gravelly loam	gl		
sand	s	stony loam	stl		
fine sand	fs	silt	si		
very fine sand	vfs	silt loam	sil		
loamy coarse sand	lcos	clay loam	cl		
loamy sand	ls	silty clay loam	sicl		
loamy fine sand	lfs	sandy clay loam	scl		
sandy loam	sl	stony clay loam	stcl		
fine sandy loam	fsl	silty clay	sic		
very fine sand loam	vfsl	clay	c		

STRUCTURE					
Grade:		Size:		Form or Type:	
structureless	0	very fine	vf	platy	pl
weak	1	fine	f	prismatic	pr
moderate	2	medium	m	columnar	cpr
strong	3	coarse	c	blocky	bk
		very coarse	vc	angular blocky	abk
				subangular blocky	sbk
				granular	gr
				single grain	sg
				massive	m
				loose	l

CONSISTENCE					
Wet Soil:		Moist Soil:		Dry Soil:	
nonsticky	wso	loose	ml	loose	dl
slightly sticky	wss	very friable	mvfr	soft	ds
sticky	ws	friable	mfr	slightly hard	dsh
very sticky	wvs	firm	mfi	hard	dh
nonplastic	wpo	very firm	mvfi	very hard	dvh
slightly plastic	wps	extremely firm	mefi	extremely hard	deh
plastic	wp				
very plastic	wvp				

MOTTLING							
Abundance:				Size:		Contrast:	
few	f	(0-2%)	ml	fine	1	faint	f
common	c	(2-20%)	mvfr	medium	2	distinct	d
many	m	(20-100%)	mfr	coarse	3	prominent	p

SOIL LOGS:

DATE OF TESTING: 8/12/2021

SOIL EVALUATOR: LUKE ROY
SE2740

BOARD OF HEALTH: ROBERT BRACEY
BOARD OF HEALTH

PERCOLATION RATE: P1: 10 min./in. @ 51"
P2: 9 min./in. @ 48"

Seal: COMMONWEALTH OF MASSACHUSETTS PETER J. OGREN CIVIL No. 27145 REGISTERED PROFESSIONAL ENGINEER
3/17/22

Prepared For:

Owner / Applicant
Joseph Boccelli
22 Essex Street
No. Reading, Ma. 01864
Map 60 Lot 18
Area=310,906 s.f.

Prepared By:

Hayes Engineering, Inc.
Consulting Engineers
Wakefield, MA 01880
Ph: 781 246 2800
Fax: 781 246 7596
www.hayeseng.com

Design By: gr
Drawn By: gr
Checked By: pjo
Project File: NOR-0270
Comp. No: NOR111
☐ Issued For Permit
☐ Issued For Review
☐ Issued For Bid
☐ Issued For Construction
☐ Not For Construction

No.	Revision	Date
10		
9		
8		
7		
6		
5		
4		
3		
2	Pool and patio added	3-9-2022
1		

Scale: 1"=20'
0' 10' 20' 40'

Date: October 7, 2021

Drawing Title:

Sanitary Disposal System Plan
Lot 5
24 Park Street
North Reading, Mass.01864

Drawing No.:

PRO

SHEET 3 OF 3