NOTES

Septic Tank and Building Sewer (Lots 2 & 3):

1) Use a 1000 gallon concrete septic tank with an access riser to grade, and an effluent filter.
2) Place tank a minimum of 10' from the building.
3) Use 4" cast iron or SCH 40 PVC from building to tank with one pipe joint placed on undisturbed soil to absorb settling.
4) Slope pipe from building to tank at ¼" per foot.

Pump Station (Lots 2 & 3):

1) Test pump on and off levels to verify dose volumes.
2) Test alarm level.
3) Test pump to verify minimum 28" discharge height at leachfield orifices.

Force Main (Lots 2 & 3):

1) Perform a hydrostatic leakage test of the force main at 50 psi and hold pressure for two hours.

Design Calculations (Lots 2 & 3):

Mound Leachfield - Per Section 1-903-K Design Notes
(Replacement not required per §1-902(b)(2) (Lots 2 & 3):

1) Assume (2) four bedroom houses. Daily Flow (DF) @ 140 gpd/br for the first three, and 70 gpd for the remaining bedroom = 490 gpd each. Total Daily Flow (DF) = 980 gpd.
2) Application rate (AR) = 1.0 gal/sf/day per §1-911(a) Maximum application rate for effluent in mound trench = 1.0 gal/sf/day
3) Required trench area: DF/AR = 980 gpd / 1 g/sf/day = 980 sf
5) Actual area: two trenches @ 4' x 140' = 1120 sf
6) Basal area application rate: 910 gpd / 0.74 gpd/sf = 1229.7 sf
7) Basal area = 3982 sf
8) Maximum Linear Loading Rate (LLR) = h x f, where
h = (depth to limiting layer) - (required unsaturated flow depth)
= 13" + 30" (mound sand) - 36" (unsaturated flow) = 7" or 0.58'.
and f = LLR factor = 13.1 gpd/lf/ft for silty loam, with a 15.1-20% slope.
Therefore, maximum LLR = 0.58 x 13.1 = 7.6 gpd/lf.
9) Actual LLR = 980 gpd/ 140 lf = 7.0 gpd/lf. which is less than the maximum allowed.

A Performance Based Design requires 6" naturally occurring unsaturated soil above the calculated level of the effluent plume. Based on #8 above, the Maximum Linear Loading Rate of 7.6 gpd/lf will result in 7" of mounding. As the limiting layer is at 13", 7" of mounding results in an effluent plume 6" below grade which meets the 6" requirement

Leachfield - Construction Notes (Lots 2 & 3):

1) Contact the consultant prior to any work to discuss system layout and inspection requirements.
2) Construction of the mound shall not take place if the soil moisture content is high. If questionable contractor to contact designer prior to construction.
3) Install force main, leaving 4"± above grade.
4) Plow or scarify to limits of fill. Area to be plowed to a depth of 8" with plow lines running parallel with the contours, and throwing the soil uphill. Do not plow if area is wet. Do not run machinery on plowed surface.
5) Mound sand to meet the requirements of §1-921(g), see table:

	Sieve Number	Opening (mm)	Percent Passage, by Weight
	3/8	9.500	85 - 100
	40	0.420	25 - 75
Option 1	60	0.240	0 - 30
	100	0.149	0 - 10
	200	0.074	0 - 5
	4	4.750	95 - 100
	8	2.380	80 - 100
Option 2	16	1.190	50 - 85
	30	0.590	25 - 60
	50	0.297	10 - 30
	100	0.149	2 - 10
	3/8	9.500	85 - 100
Option 3	40	0.420	30 - 50
	200	0.074	0 - 5

6) Sand is to be stockpiled on the edge of the plowed area and placed with a small track machine, keeping a minimum of 6" of sand below the tracks. Do not compact the sand.
7) Place 8" of 1"-1½" clean hard crushed stone or washed stone per the detail. Lay pressure piping and connect to force main. Drill every other hole pointed down spaced according to the detail. Ream all holes to remove burrs. Install orifice shields over all holes. System must be tested prior to covering.
8) Cover pipe with a minimum of 2" of stone and filter fabric. Topsoil, seed, and mulch the entire area. Place erosion control matting or designer approved equivalent on all slopes steeper than 3:1. Grade to drain runoff away from system.

Water Supply Basis of Design (Both Houses):

1) Design flow = 4 bedroom house @ 490 gpd
2) Design rate (gpm) = 0.68
3) Instantaneous peak demand (gpm) = 5 gpm
4) Source capacity = to be determined
5) Storage capacity = not required per §1-1109(D)(1) of the Rules
6) Pump capacities = to be determined
7) Operating pressure ranges = 30-50 psi
8) Reference to the floodplain = this project is not in the floodplain

Water Supply Well:

1) Install well in the location shown on the plan.
2) Provide well driller's log.
3) Provide well driller's certification as specified below.

VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Drinking Water & Groundwater Protection Division
THIS IS SUBJECT TO PROVISIONS OR CONDITIONS LISTED IN PERMIT
Permit #: WW-5-3297-1
Date: 01/06/2022

Inspections and Certifications:

1) It is the owner's/ contractor's responsibility to contact the consultant (McCain Consulting - 802-244-5093) for the following:

a) For stakeout of the well and leachfield locations - Please provide 2 weeks notice.
b) For inspection of the scarification of the soil prior to placing stone. Please provide 72 hours notice.
c) For inspection of the pressurization of the force main to 50 psi.
d) To observe pump operation and to verify discharge height at the leachfield.

2) The septic system installer will provide the consultant with a signed and dated statement as follows:

"I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the wastewater system has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

3) The well driller will provide the consultant with a signed and dated statement as follows:

"I hereby certify that the installation-related information submitted is true and correct, and that in the exercise of my reasonable professional judgment, the potable water supply has been installed in accordance with the permitted design and all permit conditions, was inspected, was properly tested, and has successfully met those performance tests.

4) The certification of construction as required by section 1-311(b) of the Environmental Protection Rules may not be provided by the designer if the procedures outlined herein are not followed.

Maintenance:

(1) At least once a year, the depth of sludge and scum in the septic tank should be measured. The tank should be pumped if:
(a) The sludge is closer than twelve inches to the outlet baffle,or
(b) The scum layer is closer than three inches to the septic tank outlet baffle.
(c) Following septic tank cleaning in units over 5,000 gallons, all interior surfaces of the tank should be inspected for leaks and cracks.

(2) At least twice a year, the outlet filter on the septic tank should be removed and cleaned by spraying it with water under normal household pressure.

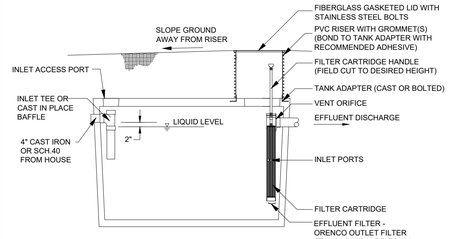
(3) At least once a year, dosing tanks and distribution boxes should be opened and settled solids removed as necessary and the dosing tank or distribution box checked for levelness.

(4) At least once a year, pump stations should be inspected:

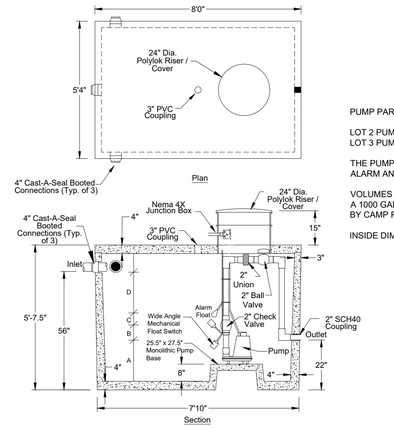
(a) Remove settled solids as necessary. Solids and scum accumulation in the pump station may be indicative of a septic tank outlet filter malfunction, septic tank overloading, or other cause that should be investigated and remedied.
(b) On/off and alarm floats should be tripped to ensure proper operation.
(c) Inspect delivery of filtrate to the leachfield. Slow delivery may indicate impending pump failure.

(5) Toxic or hazardous substances should in general not be disposed of in septic systems. These substances may pass through the system in an unaltered state and contaminate groundwater or remain in the septage and subsequently contaminate the soil or corps at the site of ultimate disposal.

(6) The leachfields are not designed for the disposal of filter backwash or other byproducts of water treatment, filtration or purification systems.



TYPICAL SEPTIC TANK
(NOT TO SCALE)



PUMP PARAMETERS:

LOT 2 PUMP IS TO DELIVER 30 GPM AT 18 FEET TDH.
LOT 3 PUMP IS TO DELIVER 30 GPM AT 80 FEET TDH.

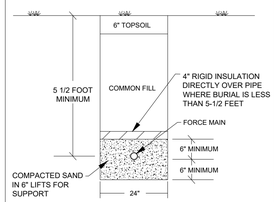
THE PUMP IS TO BE SUPPLIED WITH STANDARD ALARM AND CONTROLS AS SUPPLIED BY THE MANUFACTURER

VOLUMES AND FLOAT SETTINGS ARE BASED ON A 1000 GALLON PUMP STATION MANUFACTURED BY CAMP PRECAST CONCRETE PRODUCTS

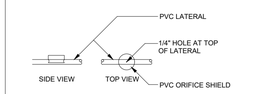
INSIDE DIMENSIONS VARY WITH EACH TANK SUPPLIER

TYPICAL 1000 GALLON PUMP STATION
(NOT TO SCALE)

1000 Gallon Pump Station Volumes (In Gallons) by Camp Precast		Static Level (A)	Dose Volume (Daily Flow) (B)	Between On and Alarm (C)	Total Gallons Used	Min. Req. Storage.	Emergency Storage Avail. (D)
Bedrooms	Tank Capacity						
2	1109	340	70	64	334	280	775
3	1109	340	105	64	509	420	600
4	1109	340	123	64	527	490	582
5	1109	340	140	64	544	560	565

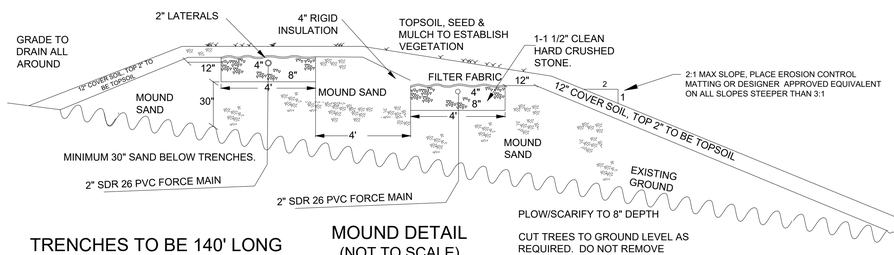


FORCE MAIN TRENCH DETAIL
(NOT TO SCALE)



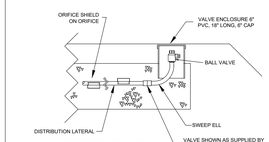
INSTALL ORIFICE SHIELD OVER EACH LATERAL HOLE AFTER THE PUMP DISCHARGE TEST IS COMPLETED AND WITNESSED BY THE DESIGNER.

ORIFICE SHIELD DETAIL
(NOT TO SCALE)



TRENCHES TO BE 140' LONG

MOUND DETAIL
(NOT TO SCALE)
(LOTS 2 & 3)



FLUSHING VALVE DETAIL
(NOT TO SCALE)

Soil Information

Test pits dug 8/18/03 by open pit backhoe

SB-1
0 -15" Brown topsoil gravelly sandy loam, very friable
15"-24" Gray brown slightly gravelly silty loam
Common distinct mottles
24"-38" Gray dense silty loam
Common distinct mottles

SB-2
0 -17" Brown topsoil gravelly very sandy loam, very friable
17"-26" Gray brown gravelly sandy loam, friable
Common distinct mottles
26"-51" Gray dense silty loam
Common distinct mottles

SB-5
0 -6" Brown topsoil, loam
6" -15" Orange brown fine sandy loam
15"-24" Gray brown slightly gravelly fine sandy loam
Trace of sand
Common faint mottles
24"-48" Gray brown silty loam, firm
Common distinct mottles

SB-6
0 -9" Brown topsoil loam
9" -35" Gray brown silty loam
Common faint mottles
Friable to 20" then firm

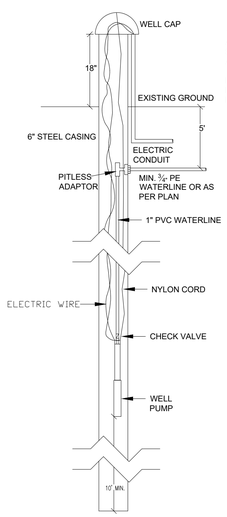
SB-7
0 -8" Brown topsoil loam
8" -19" Orange brown slightly gravelly sandy loam
19"-52" Gray brown slightly gravelly silty loam
Common faint mottles

SB-8
0 -9" Brown topsoil loam
9" -22" Orange brown gravelly sandy loam, very friable
Few faint mottles @ 17"
22"-44" Gray dense silty loam
Common distinct mottles

SB-9
0 -5" Brown topsoil, loam
5" -13" Gray silty loam
13"-32" Gray silty loam, firm
Common distinct mottles

SB-10
0 -6" Brown topsoil loam
6" -18" Orange brown gravelly sandy loam, very friable
18"-25" Gray brown slightly gravelly fine sandy loam
Common faint mottles
25"-42" Gray silty loam, dense
Common distinct mottles

SB-11
0 -9" Brown topsoil loam
9" -32" Orange brown gravelly sand
Common faint mottles @ 13"
32"-47" Gray brown silty loam
Common distinct mottles



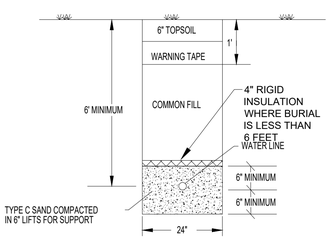
THE WELL SHALL BE DRILLED PER VERMONT WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES, SUBCHAPTER 12

DRILLED WELL DETAIL (TYPICAL)
(NOT TO SCALE)

TESTING OF NEW WELLS

ALL NEWLY PERMITTED WELLS SHALL BE QUALITY TESTED PER SECTION 1-1113, PAGES 194-197 OF THE WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES EFFECTIVE APRIL 12, 2019.

DISINFECTION OF THE NEW SERVICE WELL SHALL BE PERFORMED PER SECTION 1-1210 OF THE RULES BEFORE THE NEW SOURCE IS PUT INTO SERVICE.

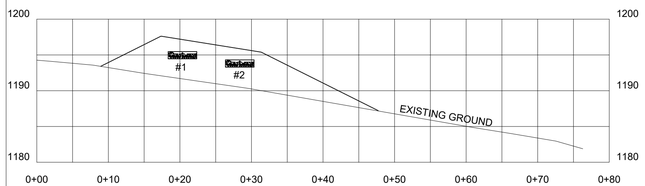


WATER LINE TRENCH DETAIL
(NOT TO SCALE)

DESIGN INTENT - LOTS 1 & 2:
THE INTENT OF THIS DESIGN IS TO HAVE A MINIMUM OF 30" OF SAND BELOW THE LEACHFIELD STONE. CONTRACTOR TO VERIFY ALL GRADES AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION AND CONTACT DESIGNER IF DISCREPANCIES ARE FOUND.

MOUND SYSTEM INVERTS

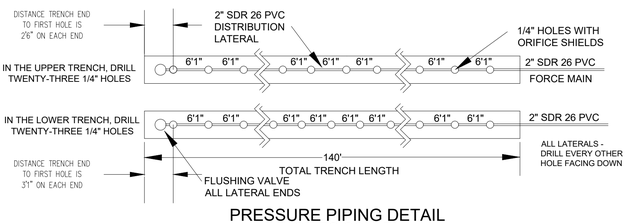
TRENCH	BOTTOM OF STONE	DISTRIBUTION PIPE INVERT
1	1194.5'	1195.2'
2	1193.3'	1194.0



HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

THE CONTRACTOR SHALL REVIEW ALL CONSTRUCTION ACTIVITIES, COMPONENT LOCATIONS, SPECIFICATIONS, AND DETAILS PRIOR TO COMMENCEMENT OF SITE WORK AND SHALL NOTIFY MCCAIN CONSULTING OF ANY ISSUES OR DISCREPANCIES THAT ARISE FROM THAT REVIEW.

140' TRENCH
UPPER PIPE LENGTH FIRST HOLE TO LAST HOLE = 133' 10" - 23 HOLES
LOWER PIPE LENGTH FIRST HOLE TO LAST HOLE = 133' 10" - 23 HOLES
SEE FLUSHING VALVE DETAIL TO DETERMINE TOTAL PIPE LENGTH



PRESSURE PIPING DETAIL
(NOT TO SCALE)
(LOTS 1 & 2)

Hand augers excavated 9/27/2021

DEPTH (IN)	TXTR	COLOR	STRUCT	CNST	REDOX	COMMENTS
A-1						
0" 08"	VFSL	10YR 3/3	SBK	FR		TOPSOIL
08"-14"	VFSL	10YR 4/2	SBK	FR		
14"-18"	SiL	7.5YR 3/1	SBK	FI	CF	
ESHWT @ 14"						
A-2						
0"- 06"	VFSL	10YR 3/3	SBK	VFR		TOPSOIL
06"-14"	FSL	10YR 3/2	SBK	FR		
14"-20"	SiLo	7.5YR 3/2	SBK	FI	CF	
ESHWT @ 14"						
A-3						
0"- 07"	VFSL	10YR 3/3	SBK	VFR		TOPSOIL
07"-13"	FSL	10YR 3/2	SBK	FR		
13"-18"	SiLo	7.5YR 3/2	SBK	FI	CF	
ESHWT @ 13"						

STATE OF VERMONT
GEORGE N. McCAIN JR.
No. 92506
LICENSED
PROFESSIONAL ENGINEER
2021.12.13

ENGINEER:
GEORGE N. McCAIN Jr., P.E.
VT P.E. 92506

DETAILS
DAVID M. DION
WASTEWATER DESIGN FOR LOTS 2 & 3
AMENDMENT TO WW-5-3297
EAST WARREN ROAD WAITSFIELD, VT

SCALE : NTS
DESIGNED BY: GNM PROJECT #23077
DRAWN BY: WDB
CHECKED BY: GMJr

McCAIN CONSULTING, INC.
93 SOUTH MAIN STREET
WATERBURY, VERMONT 05676

DATE: SEPTEMBER 20, 2021 SHEET C-2