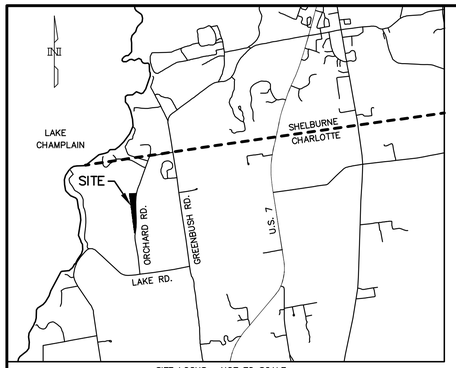
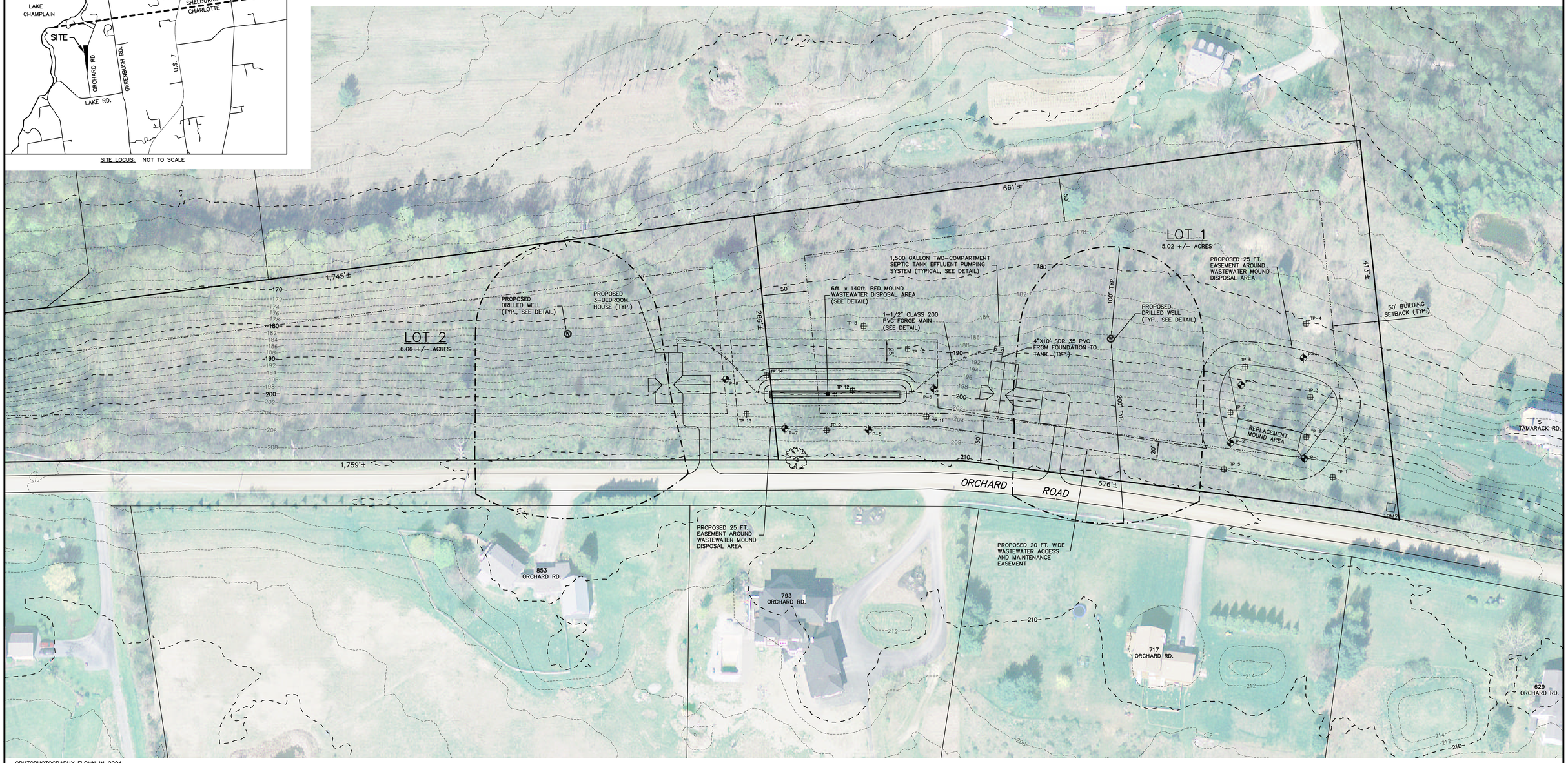


SITE LOCUS: NOT TO SCALE



ORHTOPHOTOGRAPHY FLOWN IN 2004.

LEGEND

- PROPERTY LINE
- EXISTING GROUND CONTOUR (Minor/Major)
- FINISH GRADE CONTOUR
- PERCOLATION TEST LOCATION
- TEST PIT LOCATION
- WELL SEPARATION ZONE

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NO.	DATE	DESCRIPTION	BY
1	8-1-07	REVISED WASTEWATER DISPOSAL AREA BASED ON PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS	S.M.S.

SITE PLAN

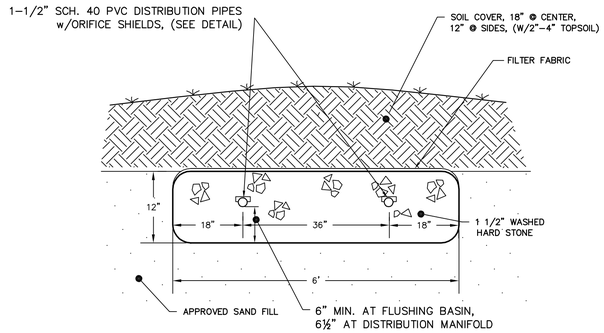
JAMES HUNTINGTON
ORCHARD ROAD
CHARLOTTE, VERMONT

STATE OF VERMONT — DAVID W. FRANCOUA — NO. 280-B — CERTIFIED SITE TECHNICIAN

Ridge Consulting Engineers
434 Shelburne Road - P.O. Box 4503
Burlington, Vermont 05406 (802)863-7182

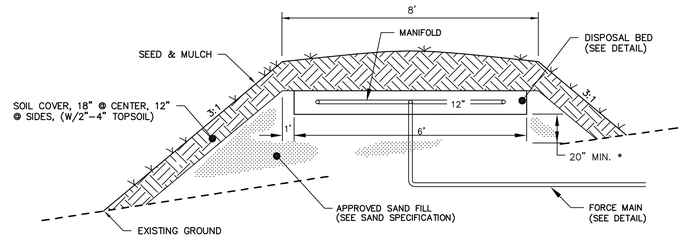
- Water Supply & Wastewater
- Site Engineering & Design
- Stormwater Management
- Topographic Surveys
- Act 250 Permitting
- Wetland Evaluations

SCALE: NOTED	DATE: 5-30-07
DRAWN: S.M.S.	PROJECT NO.: 07600
PROJECT MANAGER: D.W.F.	APPROVED: D.W.F.
FILE: HUNTINGTON SUBDIVISION.dwg	☐ DRAFT ☒ FINAL
SHEET 1	OF 3



DISPOSAL BED DETAIL

NOT TO SCALE



MOUND SECTION DETAIL

NOT TO SCALE

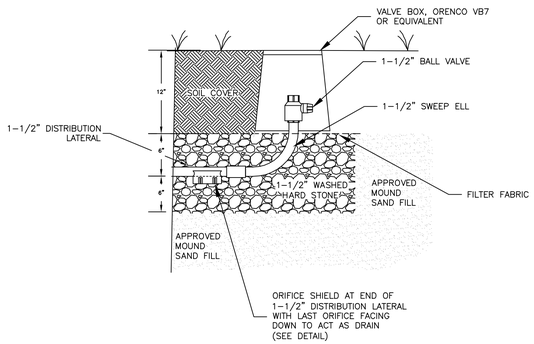
* BASED ON PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS PREPARED BY DAVID W. FUQUA, LICENSED DESIGNER #280-B, DATED 7/31/07.

Mound Sand Specifications

Mound sand should conform to one of the following specifications:

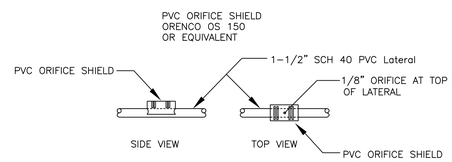
	% passing	sieve size	mm
1.	85 – 100%	10	2
	25 – 75	40	.42
	0 – 30	60	.24
	0 – 10	100	.149
	0 – 5	200	.074
2.	95 – 100%	4	4.75
	80 – 100	8	2.38
	50 – 85	16	1.19
	25 – 60	30	0.59
	10 – 30	50	0.297
	2 – 10	100	0.149
3.	85 – 100%	10	2.0
	30 – 50	40	.420
	5 – 10	200	.074

NOTE:
THE MOUND SAND MUST MEET THE SPECIFICATIONS (1), (2), OR (3) ABOVE. INTERPOLATION OF ANALYSES IS NOT PERMITTED. FILL MATERIAL (2) IS ASTM SPECIFICATIONS C-33 AND IS INTENDED FOR MANUFACTURED MATERIAL.



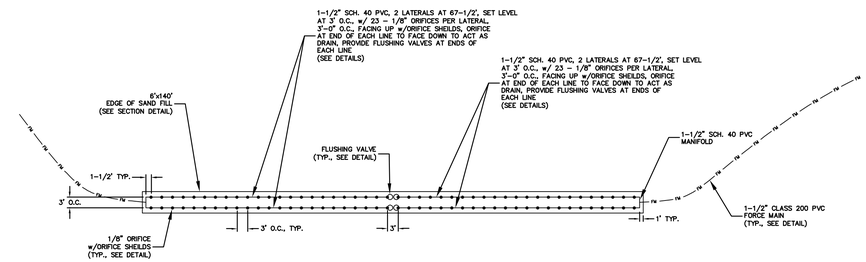
FLUSHING VALVE DETAIL

NOT TO SCALE



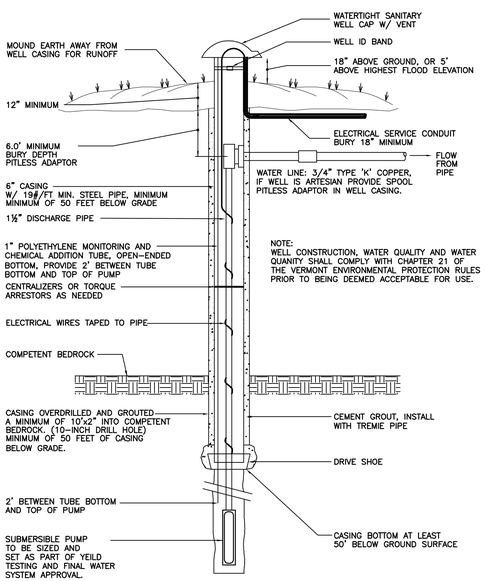
STANDARD ORIFICE SHIELD DETAIL

NOT TO SCALE



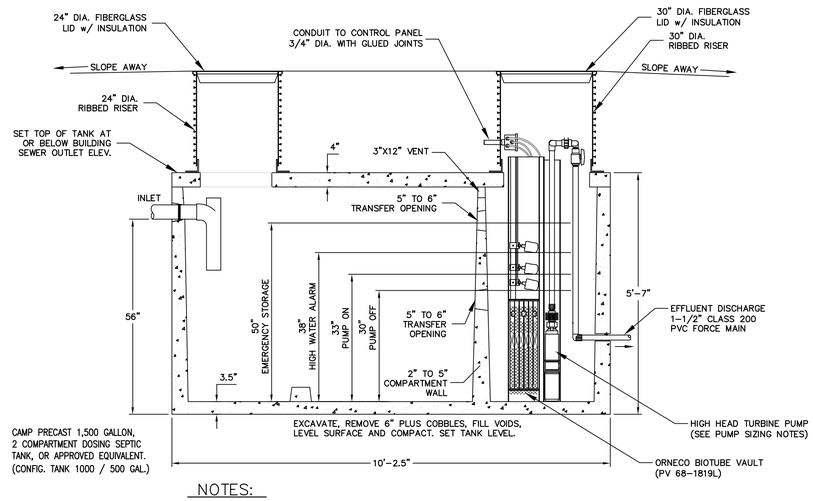
DISPOSAL BED LAYOUT

1"=20'



BEDROCK WELL INSTALLATION DETAIL

NOT TO SCALE

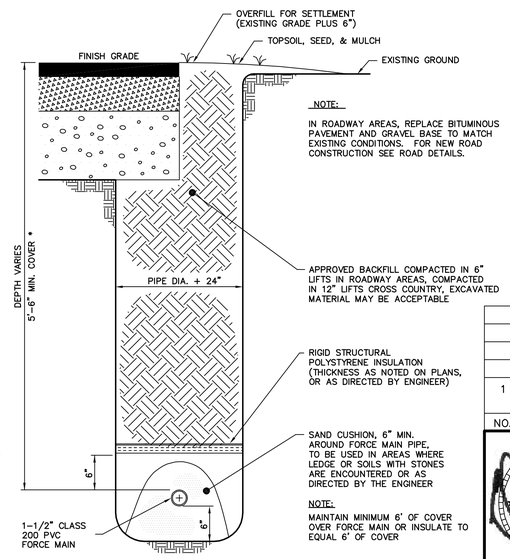


NOTES:

1. PROVIDE A HIGH WATER AUDIO AND VISUAL ALARM, TO BE INSTALLED IN BUILDING.
2. PROVIDE 420 GALLONS OF EMERGENCY STORAGE ABOVE THE ALARM FLOAT.
3. SUPPLIER TO CERTIFY SUITABILITY OF STATION BASED ON SITE CONDITIONS.
4. INSIDE TANK DIMENSIONS: 66"w X 116.5"l X 52.5"h (to inlet invert)
5. DOSE VOLUME: 105 GAL./DOSE (420 GPD/ 4 DOSES).

1,500 GALLON TWO COMPARTMENT SEPTIC TANK EFFLUENT PUMPING SYSTEM DETAIL

NOT TO SCALE



NOTE:
IN ROADWAY AREAS, REPLACE BITUMINOUS PAVEMENT AND GRAVEL BASE TO MATCH EXISTING CONDITIONS. FOR NEW ROAD CONSTRUCTION SEE ROAD DETAILS.

NOTE:
MAINTAIN MINIMUM 6' OF COVER OVER FORCE MAIN OR INSULATE TO EQUAL 6' OF COVER

FORCE MAIN TRENCH DETAIL

NOT TO SCALE

* MUST MAINTAIN 3-FEET MIN. OF SOIL COVER, NATIVE/BORROW. USE RIGID STRUCTURAL POLYSTYRENE INSULATION, THICKNESS AS NOTED ON PLANS, OR AS DIRECTED BY ENGINEER.

NO.	DATE	DESCRIPTION	BY
1	8-1-07	REVISED WASTEWATER DISPOSAL AREA BASED ON PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS	S.M.S.

STATE OF VERMONT — DAVID W. FUQUA — #280-B — LICENSED SITE TECHNICIAN

DETAILS

JAMES HUNTINGTON
ORCHARD ROAD
CHARLOTTE, VERMONT

Ridge Consulting Engineers
• Water Supply & Wastewater
• Site Engineering & Design
• Stormwater Management
• Topographic Surveys
• Act 250 Permitting
• Wetland Evaluations
434 Shelburne Road - P.O. Box 4503
Burlington, Vermont 05406 (802)863-7182

SCALE:	DATE:
NOTED	5-30-07
DRAWN: S.M.S.	PROJECT NO.: 07600
PROJECT MANAGER: D.W.F.	APPROVED: D.W.F.
FILE: HUNTINGTON SUBDIVISION.dwg	☐ DRAFT ☒ FINAL
SHEET 2	OF 3

DESIGN NOTES:

1. Description:

   These drawings were prepared for a proposed two lot subdivision off Orchard Road in Charlotte. The proposed three-bedroom single family residences will be served by a shared mound wastewater disposal system. Each lot will be served by an individual on-site drilled well.

2. Water Supply:

   A. The proposed drilled wells are to be located as shown on the Site Plan. Locations for drilled wells on any lots created in the future must meet the requirements of the Vermont Environmental Protection Rules, (Vermont Water Supply Rule - Chapter 21, Appendix A, Part 11.4), including the following minimum isolation distances:

Source of Contamination:	Isolation Distance:
Septic Tanks & Pump Stations:	50 feet
Sewer lines & Force Mains:	50 feet
Buildings:	10 feet
Drives:	15 feet

   B. Maintain a 25-foot minimum isolation distance between water service lines and wastewater disposal system and related tanks. Maintain a minimum 10-foot horizontal distance between sewer service lines and water service lines.

   C. Well Yield:

   The Average Day Demand, (ADD), for a proposed four bedroom house is 490 gal./day. The Maximum Day Demand, (MDD) is calculated by dividing the ADD by not more than 720 minutes. The resulting flow rate is expressed in gallons per minute and equals the minimum well yield allowed without required storage. The MDD is:

   (490 gal./day) / (720 minutes) = 0.68 gallons per minute.

   However, wells that have yields less than the Instantaneous Peak Demand of 5 gallons per minute may require some type of storage.

   D. Conventional water saving plumbing fixtures including, but not limited to, maximum 3 ½ gallons per flush toilets, maximum 2 g.p.m. low flow showerheads and faucet aerators will be used in the proposed houses.

   E. The Owner is responsible for assuring the project well provides adequate quality and quantity before it is deemed ready for use. By this plan the Designer makes no guarantee as to well yield or quality.

3. Sewage Disposal:

   A. Design Flow for Residential Units:

   The design flow for single-family residential units shall be calculated on the following requirements:

   1. The design flow for each person shall be 70 gallons per person per day;

   2. The first three bedrooms shall be assumed to have two persons per bedroom;

   3. Each additional bedroom may be assumed to one person per bedroom. When a building will be subject to rental use or when it is likely there will be extended or frequent high occupancy use, the system should be sized for at least 2 persons per bedroom.

   4. The design flow for a single-family residence on its own individual lot shall be based on a minimum of three bedrooms.

   Therefore, as a three bedroom single-family residence, the design flow is 420 gal./day, and a total of 840 gal./day for two, 3-bedroom residences.

   B. Sewage Disposal System Design:

   Based on an application rate of 1 gal./s.f./day; The required disposal area for this proposal is:

   (840 gal./day) / (1 gal./s.f./day) = 840 s.f.

   Primary Mound Sewage Disposal Area:
   For a 6-foot wide bed, 140 l.f. of bed is required; use one 6.0 ft. x 140.0 ft. mound disposal bed with a minimum of 20" of mound sand below disposal bed.* Design provides 840 s.f. of disposal area.

   Replacement Mound Sewage Disposal Area:
   For a 4-foot wide trench, 210 l.f. of trench is required; use three 4.0 ft. x 70.0 ft. mound disposal trenches, 8' O.C. with a minimum of 26" of mound sand below disposal trenches.* Design provides 840 s.f. of disposal area.

   * Based on Prescriptive Desktop Mounding Analysis prepared by David W. Fuqua, Licensed Designer #280-B, Dated 7/31/07.

   C. Basal Area:

   Based on a design percolation rate of 19 minutes per inch, the effective basal application rate is 0.74 gal./s.f./day.

   The required basal area is:

   (840 gal./day) / (0.74 gal./s.f./day) = 1,135.1 s.f.

   Minimum basal area provided by design is 4,575 s.f.

   D. Pressure Distribution Design:

   At one orifice per 25 s.f. of disposal area, a minimum of 33.6 orifices are required. Use 92 orifices on 4 laterals at 67.5 ft., with 23 orifices per line at 3 ft. O.C.

   For a 1/8" orifice and a minimum pressure of 1 p.s.i. in the distribution network, the flow through any one orifice is:

$$Q = 12.38\,(d)^2\,(\sqrt{h})$$
$$= 12.38\,(0125)^2]\,\sqrt{2.31}$$
$$= 0.294 \text{ g.p.m.}$$

   Use 1½" Sch. 40 P.V.C. piping with solvent weld joints.

   Find the head loss along the lateral assuming a central manifold:

Orifice #	Orifice Pressure (ft.)	Orifice Flow (gpm)	Total Lateral Flow (gpm)	Segment headloss (ft.)	Lateral Length (ft.)	Sum of Headloss (ft.)
1	3.0000	0.3350	0.3350	0.0001	1.5	0.0001
2	3.0001	0.3350	0.6701	0.0003	4.5	0.0004
3	3.0004	0.3351	1.0052	0.0006	7.5	0.0010
4	3.0010	0.3351	1.3403	0.0011	10.5	0.0021
5	3.0021	0.3352	1.6754	0.0016	13.5	0.0037
6	3.0037	0.3352	2.0107	0.0023	16.5	0.0060
7	3.0060	0.3354	2.3460	0.0030	19.5	0.0090
8	3.0090	0.3355	2.6816	0.0039	22.5	0.0128
9	3.0128	0.3358	3.0173	0.0048	25.5	0.0176
10	3.0176	0.3360	3.3534	0.0058	28.5	0.0235
11	3.0235	0.3364	3.6897	0.0070	31.5	0.0304
12	3.0304	0.3367	4.0265	0.0082	34.5	0.0386
13	3.0386	0.3372	4.3637	0.0095	37.5	0.0481
14	3.0481	0.3377	4.7014	0.0109	40.5	0.0590
15	3.0590	0.3383	5.0397	0.0124	43.5	0.0714
16	3.0714	0.3390	5.3787	0.0140	46.5	0.0854
17	3.0854	0.3398	5.7185	0.0157	49.5	0.1010
18	3.1010	0.3406	6.0591	0.0174	52.5	0.1184
19	3.1184	0.3416	6.4007	0.0193	55.5	0.1377
20	3.1377	0.3426	6.7433	0.0212	58.5	0.1590
21	3.1590	0.3438	7.0872	0.0233	61.5	0.1822
22	3.1822	0.3451	7.4322	0.0254	64.5	0.2077
23	3.2077	0.3464	7.7787	0.0277	67.5	0.2353

   E. Pump Sizing:

   Total head losses: (Worst Case)

Distribution piping =	4.4'
216' of 2" P.V.C. @ 15.5 g.p.m. =	2.4'
Elevation =	20.5'
Total Dynamic Head =	27.3'

   Length of 2" PVC piping includes 100 FT. for friction loss in pump station piping.

   Use one, OSI ½ HP, P2005 Effluent Pump, single phase, 230 volt, or approved equivalent; Pumps to provide 15.5 g.p.m. against 27.3 feet Total Dynamic Head.

4. Boundary Information:

   Boundary information provided by Stuart Morrow, L.S.

February 2006

SOIL PROFILES

For the:

James Huntington Property

Orchard Road - Charlotte, Vermont.

The following test pits and percolation tests were logged by Frank R. O'Brien, P.E, on the dates noted. These notes were transcribed by Ridge Consulting Engineers from the archives of Frank R. O'Brien, P.E. in February 2006.

SHWT = Seasonal high water table, NGWTD = No groundwater to depth, NBRTD = No bedrock to depth

Test Pit No. 1 — June 26, 1997

0 – 9" Topsoil.
9" – 18" Gray brown blocky stony silt loam.
18" – 31" Light brown compact stony silt loam, few mottles at lower interface.
31" – 48" Compact to dense lt. brown stony silt loam with some clay, light mottling.
SHWT = 31", NGWTD, NBRTD

Test Pit No. 2

0 – 8" Topsoil.
8" – 18" Gray brown blocky stony silt loam.
18" – 27" Light brown compact, blocky stony silt loam, few mottles at lower interface.
27" – 48" Compact to dense lt. brown, blocky stony silt loam with some clay, light mottling.
SHWT = 27", NGWTD, NBRTD

Test Pit No. 3

0 – 8" Topsoil.
8" – 24" Light brown blocky stony silt loam.
24" – 36" Compact gray brown stony silt loam, some mottles
36" – 54" Compact to dense gray blocky stony silt loam, with some clay, few mottles.
SHWT = 24", NGWTD, NBRTD

Test Pit No. 4 (At base of hill)

0 – 8" Topsoil.
8" – 22" Brown blocky stony silt loam.
22" – 36" Compact gray brown stony silt loam with some sand pockets, few sea shells, mottled, wet at 30".
36" – 58" Dense gray brown stony silt loam with some clay, mottled.
SHWT = 22", NGWTD, NBRTD

Test Pit No. 5

0 – 8" Topsoil.
8" – 22" Brown blocky stony silt loam.
22" – 28" Compact gray brown blocky stony silt loam with some mottles.
28" – 48" Compact to dense gray brown stony silt loam with some clay, mottled.
SHWT = 22", NGWTD, NBRTD

Test Pit No. 6 (Near base of slope)

0 – 8" Topsoil.
8" – 25" Brown stony silt loam.
25" – 33" Compact light brown stony silt loam with few mottles.
33" – 48" Dense gray brown stony silt loam with some clay, some mottles.
SHWT = 25", NGWTD, NBRTD

Test Pit No. 7

0 – 8" Topsoil.
8" – 21" Brown blocky stony silt loam.
21" – 26" Compact light brown blocky stony silt loam with few mottles.
26" – 50" Compact to dense gray brown blocky stony silt loam with some mottles.
SHWT = 21", NGWTD, NBRTD

Test Pit No. 8

0 – 8" Topsoil.
8" – 26" Orange brown stony silt loam.
26" – 48" Dense gray brown stony silt loam with some clay, some mottles.
SHWT = 26", NGWTD, NBRTD

Test Pit No. 9

0 – 8" Topsoil.
8" – 18" Gray brown blocky stony silt loam, some mottling @ 15".
18" – 48" Compact to dense gray brown stony silt loam with some mottles.
SHWT = 15", NGWTD, NBRTD

Test Pit No. 10

0 – 8" Topsoil.
8" – 25" Brown stony silt loam.
25" – 30" Compact gray brown blocky stony silt loam with some mottles.
30" – 48" Compact to dense gray brown stony silt loam with some mottles.
SHWT = 25", NGWTD, NBRTD

Test Pit No. 11

0 – 8" Topsoil.
8" – 24" Brown blocky stony silt loam, (Uphill side of pit).
8" – 24" Gray brown blocky stony silt loam, (Downhill side of pit).
24" – 50" Dense gray brown stony silt loam with some mottles.
SHWT = 24", NGWTD, NBRTD

Test Pit No. 12

0 – 8" Topsoil.
8" – 22" Brown stony silt loam.
22" – 26" Compact gray brown blocky stony silt loam with few mottles.
26" – 52" Dense gray brown stony silt loam with some mottles.
SHWT = 22", NGWTD, NBRTD

Test Pit No. 13

0 – 8" Topsoil.
8" – 24" Brown blocky stony silt loam, few mottles @ 20".
24" – 42" Dense gray brown stony silt loam with some mottles.
SHWT = 20", NGWTD, NBRTD

Test Pit No. 14

0 – 8" Topsoil.
8" – 24" Brown stony silt loam.
24" – 48" Dense gray brown stony silt loam with some mottles.
SHWT = 24", NGWTD, NBRTD

Soil Profile at P – 5 — August 29, 1997

0 – 20" Topsoil/brown stony silt loam.
20" – 24" Compact gray brown stony silt loam with some light mottles.
SHWT = 20", NGWTD, NBRTD

Soil Profile at P – 6

0 – 20" Topsoil/brown stony silt loam.
20" – 24" Compact brown stony silt loam.
SHWT = 24", NGWTD, NBRTD

Soil Profile at P – 7

0 – 18" Topsoil/brown stony silt loam.
18" – 24" Compact brown stony silt loam.
SHWT = 24", NGWTD, NBRTD

Soil Profile at P – 8

0 – 18" Topsoil/brown stony silt loam.
18" – 24" Compact brown stony silt loam.
SHWT = 24", NGWTD, NBRTD

PERCOLATION TEST RESULTS:

August 29, 1997

P-1 5 Minutes per inch @ 24"
P-2 19 Minutes per inch @ 24"
P-3 19 Minutes per inch @ 24"
P-4 17 Minutes per inch @ 24"
P-5 14 Minutes per inch @ 24"
P-6 10 Minutes per inch @ 24"
P-7 26 Minutes per inch @ 24"
P-8 17 minutes per inch @ 24"

NOTICE TO PROPERTY OWNER

1. Prior to engaging a contractor or commencing construction, the owner is encouraged to study this information and/or solicit information from the design technician. The proper functioning of the completed system is dependent upon careful attention to the details and notes provided. Modifications to the design and specifications or omissions of construction procedures may lead to premature failure and render the system uncertifiable, in either case the designing engineer can not be held responsible for subsequent problems.

2. The owner is encouraged to seek professional assistance in monitoring and certifying compliance with the approved plans. As specified in the above construction notes, the owner or contractor is responsible for coordinating the schedule of construction and construction supervision.

3. The owner/contractor is responsible for assuring proper certification testing and inspections are carried out in accordance with the notes and details provided on these drawings.

4. Before commencing construction, all applicable state and local permits must be secured by the owner. This is the responsibility of the owner not the design technician.

5. This office will not certify any construction of systems depicted on these drawings unless:

   A. Prior to all construction arrangements are made with this office to provide such certification services;

   B. Construction is completed in strict adherence with the approved project plans;

   C. All changes to these plans, whether or not independently observable by the Design Technician, are to be reported to the Design Technician by the Contractor for a suitability determination; and

   D. All changes to the approved project plans have been authorized by this office and approved by all appropriate reviewing agencies.

6. Sewage Disposal System Maintenance Schedule:

   The following maintenance schedule was copied from the Vermont Environmental Protection Rules, Chapter 1, Appendix 3A - Design Guidelines. This schedule should be followed to insure proper operation of the sewage disposal system:

   3-A-01 Septic Tank Specifications & Maintenance

   (b) 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 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.

   3. 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 crops at the site of ultimate disposal.

   If your system has a pump station or dosing siphon, it should also be checked once a year. There should not be any scum or solids present. Have station/siphon cleaned out if scum and/or solids are found. Inspect the station/siphon for cracks or groundwater infiltration. Repair any cracks found. Garbage grinders and water softeners are not recommended for use with septic tank systems.

CONSTRUCTION PROCEDURE

1. Contact the Design Engineer, prior to construction for an on-site meeting with the contractor to discuss the construction and to stake out the mound with the proper orientation according to the approved plan.
2. Closely cut and remove all above ground vegetation throughout the area to be covered by the fill material. Tree stumps should be cut flush with the ground surface, but the roots should not be removed. Prior to plowing, install the dosing discharge line from the point of connection with the distribution piping header to beyond the mound construction area.
3. Plow the area to a depth of 7" to 8", parallel to the land contours with the plow throwing the soil uphill to provide a proper interface between the natural soils and fill material. Construction or plowing shall not be started when the soil moisture content is high. (If a sample of soil obtained approximatly 9" below the surface can be easily rolled into a wire, the soil mositure content is too high for construction purposes.)
4. Place the sand texture soil (See Mound Sand Specifications) around the edge of the plowed area by dumping it on the plowed area, but keep the wheels of the dump truck off the plowed area. Use a crawler tractor with a blade to move the sand around into place keeping at least 6" of sand under the tracks to minimize compaction of the plowed layer. Place all sand needed in the mound, which will be to the top of the trenches. Shape the sides to the desired slope.
5. With a backhoe form the trenches. The sand walls will stay sufficiently stable. Make sure the bottom of the trenches are level. Some hand shoveling will be required.
6. Using a bucket on the crawler, dump the stone in the trenches by traveling up the side slope. Level the stones off at the desired elevation. (6" above the trench bottom.)
7. Install the distribution piping as shown on the plan and contact the Design Engineer who will direct testing of the distribution system. Insure that the pipe is bedded properly with all dips and rises removed and cover the pipe with a minimum of 2" of the stone.
8. Place filter fabric or untreated building paper over the top of the stone.
9. Crown the entire mound with a cover of soil less permeable than the mound fill, covering with 12" on the side slopes and a minimum of 18" over the center of the mound. Native soil from the site is normally suitable for cover material, though the top 2" to 4" of this cover should be topsoil.
10. Seed and mulch the entire mound to ensure stability of the installation. Shrubs placed at the foot and up the slope on the sides and ends are recommended. However, do not place shrubs directly on top of the mound as roots may interfere with the distribution system.
11. Form the surface water diversion swale. Direct all surface water away from the mound.

NO.	DATE	DESCRIPTION	BY
1	8–1–07	REVISED WASTEWATER DISPOSAL AREA BASED ON PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS	S.M.S.

STATE OF VERMONT — DAVID W. FUQUA — 280-B — LICENSED SITE TECHNICIAN

NOTES

JAMES HUNTINGTON

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434 Shelburne Road - P.O. Box 4503
Burlington, Vermont 05406 (802)863-7182

• Water Supply & Wastewater
• Site Engineering & Design
• Stormwater Management
• Topographic Surveys
• Act 250 Permitting
• Wetland Evaluations

SCALE: NOTED	DATE: 5–30–07
DRAWN: S.M.S.	PROJECT NO.: 07600
PROJECT MANAGER: D.W.F.	APPROVED: D.W.F.
FILE: HUNTINGTON SUBDIVISION.dwg	☐ DRAFT ☒ FINAL
SHEET 3 OF 3	