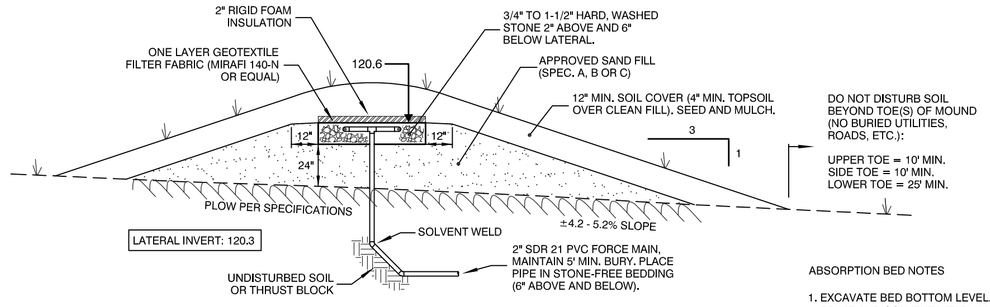
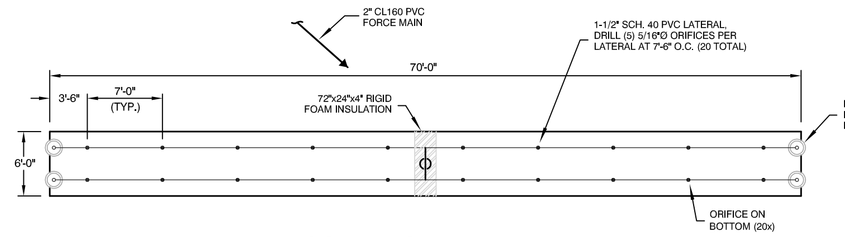


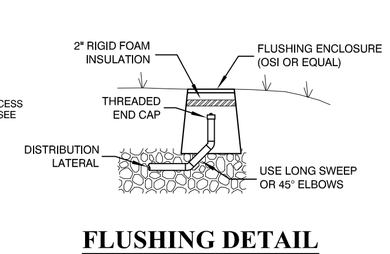
MOUND SECTION
NTS



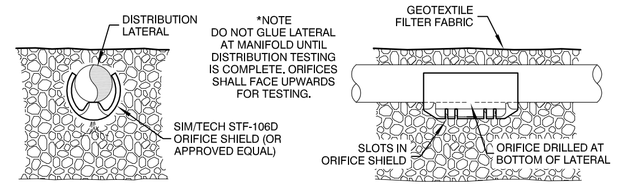
ABSORPTION BED PLAN
1" = 10'

ABSORPTION BED NOTES

1. EXCAVATE BED BOTTOM LEVEL. RAKE TO SCARIFY SURFACE.
2. PRIME AND SOLVENT WELD ALL CONNECTIONS.
3. ORIFICES SHALL POINT DOWNWARDS WITH A "SIM-TECH" ORIFICE SHIELD (OR APPROVED EQUAL) COVERING EACH HOLE (20 TOTAL).
4. DISTRIBUTION: 70'Ø = 420 SF, 420 SF/20 ORIFICES = 21.0 SF/ORIFICE.



FLUSHING DETAIL
NTS

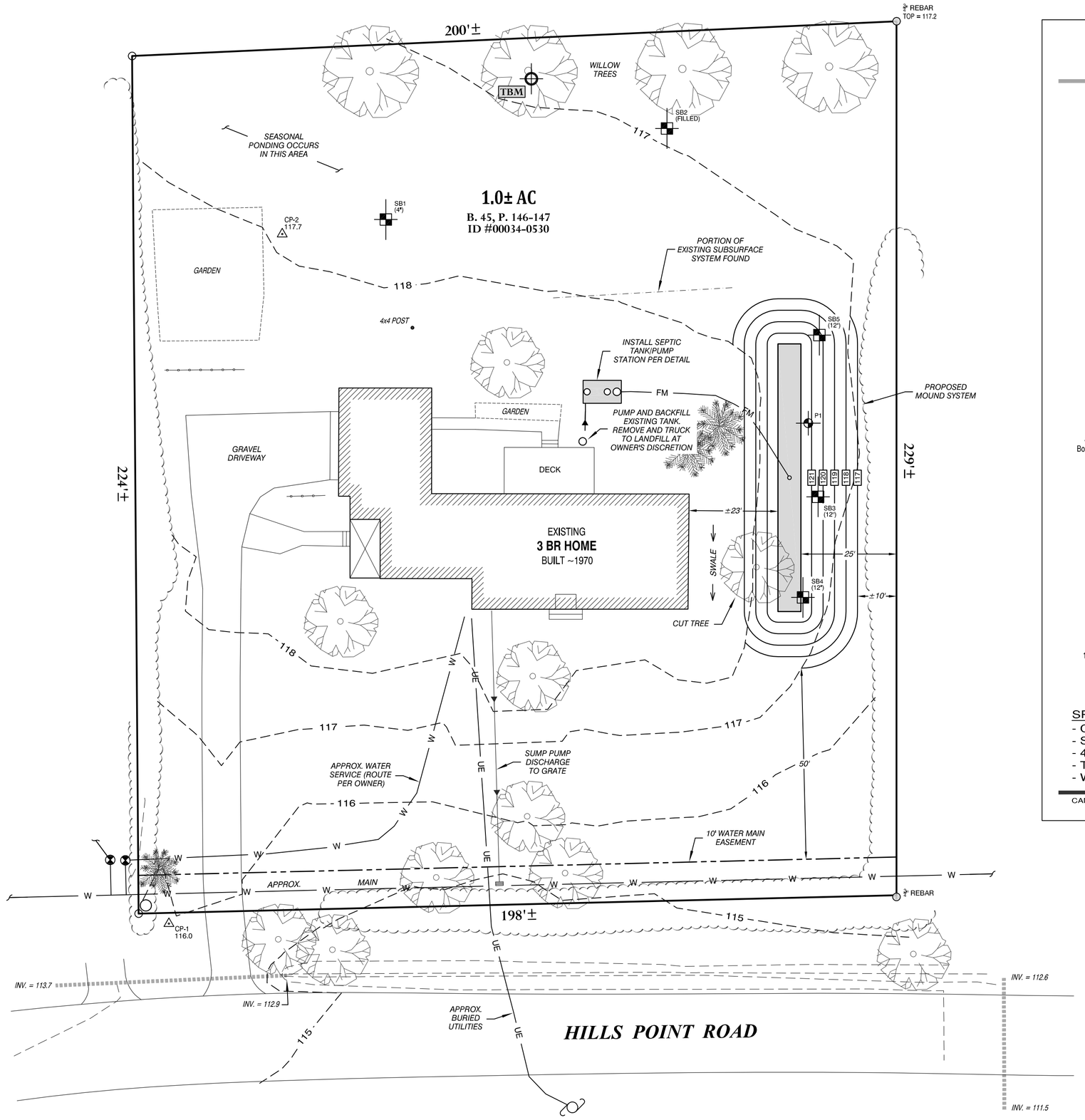


ORIFICE SHIELD
NTS

TBM
TEMPORARY BENCHMARK
SPIKE IN BASE 48" WILLOW
ELEV. = 118.7
ELEVATIONS BASED ON APPROX. LAKE LEVEL ON 8-1-13 = 97.86

SUBSURFACE TANK MINIMUM ISOLATION REQUIREMENTS	
FOUNDATION/FOOTING DRAIN	10'
WATER SERVICE	25'
DRILLED WELL	50'
DRIVEWAY	5'

- CAUTION -
GAS WITHIN SEPTIC TANKS AND PUMP STATIONS CAN CAUSE DEATH IF ENTERED WITHOUT PROPER RESPIRATORY EQUIPMENT. SUCH SPACES ARE SUBJECT TO CONFINED-SPACE ENTRY REGULATIONS PUBLISHED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA STANDARD 29 CFR 1910.146).



SITE PLAN
1" = 20'
0 20 40 60 80 FT

TRUE
MAGNETIC

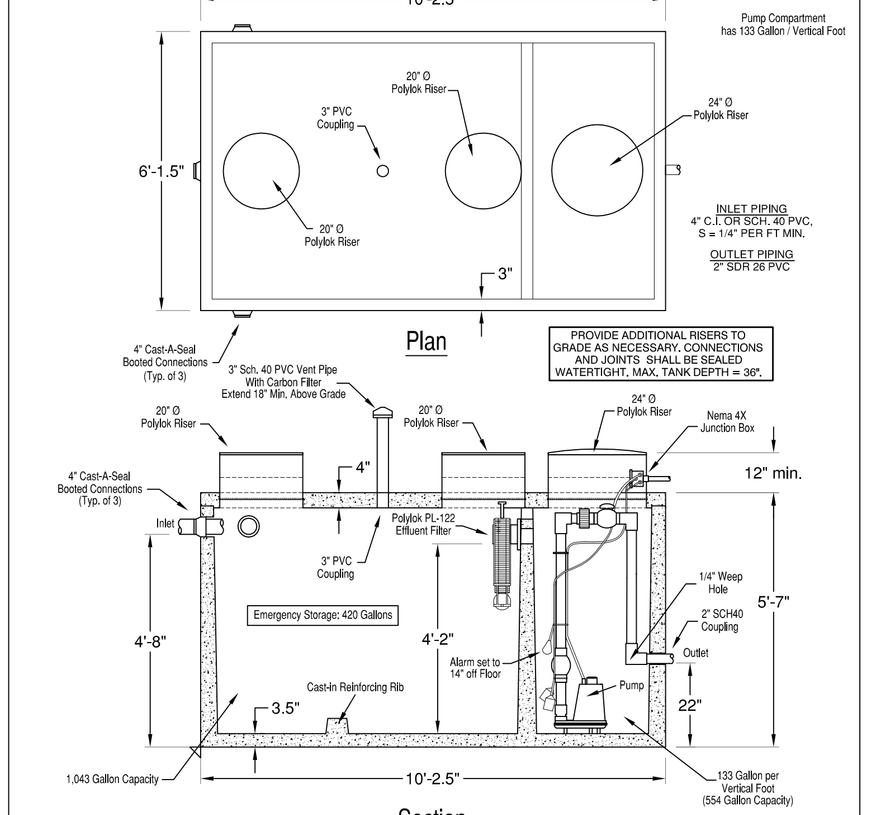
FOOTING DRAIN OUTFALL AT EDGE OF STREAM (SERVES CARPENTER HOME) INVERT = 105.9

- EXISTING SYSTEM NOTE -
PORTIONS OF THE EXISTING WASTEWATER SYSTEM THAT INTERFERE WITH CONSTRUCTION SHALL BE DISPOSED OF IN ACCORDANCE WITH §1-924 OF THE 2007 VT ENVIRONMENTAL PROTECTION RULES.

- MOUND NOTE -
THE LAND AREA 25' DOWNGRADIENT OF THE ELEVATED SAND MOUND IS THE EFFLUENT DISPERSAL AREA AND SOIL IN THIS AREA MAY NOT BE REMOVED OR DISTURBED (TO EXTEND OF OWNERSHIP). DO NOT DISTURB SOIL WITHIN 10' OF ALL OTHER TOES.

NO CONSTRUCTION, VEHICULAR TRAFFIC OR PARKING IS PERMITTED ON TOP OF THE MOUND OR SUBSURFACE TANKS. CONTACT THE DESIGNER AS NECESSARY FOR MORE INFORMATION.

Precast Pump Station
1500 Gallon Simplified STEP



SPECIFICATIONS:
- Concrete Minimum Strength 5000psi @ 28 days
- Steel Reinforcement Grade 60
- 4" Cast-A-Seal Booted Connections
- Top Seam Construction
- Weights Subject to Variation

PRECAST CONCRETE PRODUCTS
78 PRECAST ROAD MILTON, VT 05468 .802.893.2401
TOLL FREE 1.888.299.2401 FAX 802.893.1542

CAMP Precast Concrete Products www.CAMPPRECAST.com — Revision Date : 2/7/2012 — Section : 5

SUBSURFACE TANK NOTE

THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AN AREA WHICH CONTAINS SUFFICIENT SOIL DEPTH FOR TANK PLACEMENT. ALTERNATE LOCATIONS MAY BE REQUIRED TO ACHIEVE DESIRED ELEVATIONS AND PROPER SOIL COVER OVER TANK. SOIL DEPTH SHOULD VERIFIED PRIOR TO ORDERING OR DELIVERY OF TANK(S).

KEEP EXCAVATION FREE OF WATER DURING INSTALLATION. PLACE 3"–6" CRUSHED STONE BED BENEATH TANK.

PROVIDE INTERIOR OR EXTERIOR AUDIO-VISUAL ALARM PANEL IN LOCATION APPROVED BY OWNER. ALL ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN.

TANK VOLUME = ±133 GALS./FT.

SET FLOAT TO DISCHARGE <75-100 GALS./DOSE = 4+ DOSES PER DAY.

SELECT EFFLUENT PUMP CAPABLE OF DISCHARGING 40 GPM@15' TDH.

LEGEND

- SB1 (12') — SOIL BORING (DEPTH TO ESHWT)
- P1 — PERCOLATION TEST
- CP1 116.0 — CONTROL POINT (SPIKE IN GROUND)
- BOUNDARY CORNER (OR CALCULATED POINT)
- UTILITY POLE
- WATER VALVE
- EXISTING CONTOURS
- APPROX. BOUNDARY
- EASEMENT
- TREE LINE
- FM — FORCE MAIN
- W — WATER LINE
- UE — U/G UTILITIES

CALL DIG SAFE
PRIOR TO ANY EXCAVATION
DIAL "811" (OR 1-888-DIG-SAFE)

STATE OF VERMONT — JUSTIN T. WILLIS NO. 344-B — LICENSED DESIGNER

§1-913(c) SAND FILL SPECIFICATIONS		
(1)		
SIEVE NO.	OPENING (MM)	% PASSING (BY WGT)
3/8	9.500	85 - 100
40	0.420	25 - 75
60	0.240	0 - 30
100	0.149	0 - 10
200	0.074	0 - 5
(2)		
SIEVE NO.	OPENING (MM)	% PASSING (BY WGT)
4	4.750	95 - 100
8	2.380	80 - 100
16	1.190	50 - 85
30	0.590	25 - 60
50	0.297	10 - 30
100	0.149	2 - 10
ASTM SPECIFICATION C-33, INTENDED FOR MANUFACTURED MATERIAL.		
(3)		
SIEVE NO.	OPENING (MM)	% PASSING (BY WGT)
3/8	9.500	85 - 100
40	0.420	30 - 50
200	0.074	0 - 5
THE FILL MATERIAL MUST MEET SPECIFICATIONS (1), (2), OR (3) ABOVE. INTERPOLATION OF ANALYSIS IS NOT PERMITTED.		

TEST PIT LOGS

DATE 8/26/13
METHOD DRAIN SPADE (BY HAND)
PRESENT J. WILLIS, L.D.
S. HARRIS, FOR TOWN OF CHARLOTTE

SB–1
0"–4": DARK BROWN) VERY FINE SANDY LOAM, FRIABLE, MANY ROOTS.
4"–18". DARK OLIVE–BROWN) CLAY LOAM, FIRM, REDOX. FEATURES.

ESTIMATED SEASONAL HIGH WATER TABLE (ESHWT) 4"
LEDGE N/A

SB–2
APPROX. 6" FILL ABOVE ORIGINAL GRADE (FOUND "A" SOIL HORIZON BELOW FILL.

SB–3, 4, & 5
0"–12": DARK BROWN) VERY FINE SANDY LOAM, FRIABLE, MANY ROOTS.
12"–18". DARK OLIVE–BROWN) CLAY LOAM, FIRM, REDOX. FEATURES.

ESHWT 12"
LEDGE N/A

PERCOLATION TEST RESULTS

CONDUCTED 8–26–13

NUMBER	DEPTH	DROP	RUNS	RATE (EXTRAPOLATED)
P1	8"	0.5"	7	48.0 MPI*

*DESIGN RATE

BASIS OF DESIGN

PROJECT: EXISTING 3 BR HOME.

DESIGN FLOWS: (3 BRx140 GPD) = 420 GPD.

APPLICATION RATE: 0.8(3÷√48.0) = 0.35 GDSF (USE 1.0 MAX. RATE)
420 GPD÷1.0 GDSF = 420 SF REQUIRED AREA.

CONSTRUCT A 6'W x 70'L ABSORPTION BED = 420 SF.

BASAL AREA: 420÷0.74 GDSF = 567.6 SF = 70'Lx8.1'W.

PRESCRIPTIVE DESKTOP MOUNDING ANALYSIS

LINEAR LOADING RATE (LLR) FACTOR:

- SLOPE IN DISPOSAL AREA = ±4.2–5.2%
- VERY FINE SANDY LOAM @4.1–6%* = 7.5
- USING 11" (0.92') EFFLUENT PLUME, THE MOUNDED WATER TABLE WOULD BE 1" BELOW SURFACE (PER 12" DEPTH TO ESHWT).
- LINEAR LOADING RATE (LLR) = (0.92)(7.5) = 6.9 GPD/LF
- 420 GPD÷6.9 GPD/LF = 60.9 LF REQUIRED SYSTEM LENGTH (70' PROPOSED).

*SLOPE IN IMMEDIATE MOUND AREA.

DESIGN NOTE

TO THE EXTENT REASONABLY POSSIBLE, THIS DESIGN WAS PREPARED IN ACCORDANCE WITH CHAPTER 1, WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES, EFFECTIVE 9/29/07. PROPOSED PLACEMENT IS BASED ON AREA AND SOIL CONSTRAINTS.

REQUESTED (KNOWN) WAIVERS INCLUDE:
– ABSORPTION BED AND MOUND TOE DO NOT MEET MINIMUM ISOLATION REQUIREMENTS TO A PROPERTY LINE.
– MINIMUM SITE CONDITIONS DO NOT EXIST (CANNOT BE VERIFIED) UP TO 25' BELOW MOUND TOE.
– ADDITIONAL SAND IS NOT PROVIDED TO MAINTAIN 36" TO THE MOUNDED WATER TABLE.

USE OF LOW FLOW PLUMBING FIXTURES AND DEVICES IS STRONGLY RECOMMENDED. PLUMBING FIXTURES SHOULD BE OPERATING PROPERLY.

MOUND CONSTRUCTION SPECIFICATIONS

1. CONTACT THE DESIGNER PRIOR TO ANY CONSTRUCTION FOR AN ONSITE MEETING WITH THE CONTRACTOR TO STAKE–OUT THE MOUND SYSTEM AND TO DISCUSS CONSTRUCTION REQUIREMENTS. ALL ELEVATIONS OF FEATURES SUCH AS FLOOR, SEPTIC TANK AND PUMP STATION TO BE FIELD VERIFIED. CONTACT DESIGNER TO VERIFY PUMP SIZE IF ELEVATIONS DEVIATE FROM THOSE NOTED ON THE PLAN. REPORT ANY PROPOSED CHANGES IN THE LOCATIONS OF THE HOUSE, SUB–GRADE TANKS, DRIVEWAY, ETC.
2. THE CONTRACTOR SHALL SUBMIT A RECENT SIEVE ANALYSIS (<6 MONTHS) OF THE SAND FILL. GRAIN SIZE DISTRIBUTION SHALL COMPLY WITH EITHER SPECIFICATION (1, 2 OR 3) NOTED ON PLAN.
3. ABOVE GROUND VEGETATION SHALL BE CLOSELY CUT AND REMOVED FROM THE MOUND AREA AND 10 FEET FROM EDGE OF THE SYSTEM AS MEASURED FROM THE TOE(S). PRIOR TO PLOWING, THE PUMP DISCHARGE LINE FROM THE PUMP STATION TO THE DISTRIBUTION PIPING HEADER SHALL BE INSTALLED.
4. THE FORCE MAIN SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH ENVIRONMENTAL PROTECTION RULES, SECTION A–04. THE MINIMUM TEST PRESSURE SHALL BE 50 PSI AT THE HIGHEST POINT IN THE LINE. CONTRACTOR TO FURNISH WATER AND EQUIPMENT TO PERFORM TEST AND NOTIFY DESIGNER 48 HOURS PRIOR TO TEST.
5. PLOW THE MOUND AREA TO A DEPTH OF 7" TO 8" PARALLEL TO THE LAND CONTOUR WITH THE PLOW THROWING THE SOIL UPSLOPE TO PROVIDE A PROPER INTERFACE BETWEEN THE FILL AND NATURAL SOIL. TREE STUMPS SHOULD NOT BE PULLED. PLOW WITH A MOLD–BOARD PLOW OR A CHISEL POINT ADAPTED TO A BACKHOE BUCKET (USED IN WOODED AREAS ONLY).
6. THE MOUND PERIMETER SHALL BE GRADED TO ENSURE DIVERSION OF SURFACE WATER RUN–OFF (DIVERSION DITCH OR SWALE AS SHOWN).
7. ONCE PLOWING IS COMPLETE, CONTACT THE DESIGNER FOR AN INSPECTION OF THE SITE PRIOR TO PLACEMENT OF FILL.
8. DUMP THE APPROVED SAND FILL AROUND THE EDGE OF THE PLOWED AREA WHILE KEEPING THE TRUCK WHEELS OFF THE PLOWED AREA. WHEEL TRACKS IN THE PLOWED AREA WILL LEAD TO COMPACTION AND RUTS, ADVERSELY AFFECTING THE OPERATION OF THE SYSTEM.
9. MOVE THE SAND AROUND INTO PLACE WHILE MAINTAINING AT LEAST 12" OF SAND UNDER THE EQUIPMENT TO MINIMIZE COMPACTION OF PLOWED LAYER. SHAPE THE SIDES TO THE REQUIRED SLOPES.
10. FORM THE TRENCH/BED BY MOVING ALONG ITS LENGTH. BOTTOM OF TRENCH/BED MUST BE LEVEL. HAND WORK WILL BE NECESSARY.
11. DUMP THE STONE IN THE TRENCH/BED BY MOVING UP THE SIDE SLOPE. LEVEL THE STONE TO REQUIRED ELEVATION.
12. CHANNEL STONE FOR LATERALS. LAY PIPE LEVEL WITH ORIFICES POINTING UPWARDS (WITHOUT ORIFICE SHIELDS INSTALLED UNTIL PRESSURE TESTING IS COMPLETE).
13. CONTACT THE DESIGNER PRIOR TO BACKFILLING THE LATERALS TO TEST FOR COMPLETE AND EQUAL DISTRIBUTION. DISCHARGE RATES SHOULD NOT EXCEED 10% BETWEEN ORIFICES IN A SINGLE TRENCH/BED (OR PER SQUARE FOOT LOADING RATE IF STEPPED TRENCHES). TANKS AND FORCE MAIN SHALL NOT BE BACKFILLED UNTIL INSPECTED AS WELL.
14. FILL REMAINING 2" OF STONE OVER LATERALS AFTER TEST IS COMPLETE.
15. COVER ENTIRE TRENCH/BED WITH "MIRAFI 140–N" GEO–TEXTILE FILTER FABRIC (OR EQUAL).
16. PLACE A MINIMUM OF 4" OF TOPSOIL OVER 8" OF NATIVE SOIL OVER THE ENTIRE MOUND. CROWN 18" TOTAL IN CENTER AND SHAPE SURFACE AS SHOWN.
17. LANDSCAPE THE MOUND BY PLANTING GRASSES ON THE SURFACE. SHRUBS PLACED AT THE FOOT AND UP THE SLOPE ON THE SIDES AND ENDS ARE OPTIONAL. SHRUBS PLACED ON TOP OF THE MOUND MAY INTERFERE WITH THE DISTRIBUTION SYSTEM. UPON COMPLETION OF CONSTRUCTION, CONTACT THE DESIGNER.

OPERATION AND MAINTENANCE NOTES

1. THE DISPOSAL SYSTEM MAY REQUIRE ADJUSTMENTS OR MODIFICATIONS DURING STARTUP AS WELL AS DURING THE LIFETIME OF THE SYSTEM. THESE ADJUSTMENTS INCLUDE RE–LEVELING SUBSURFACE TANKS OR DISTRIBUTION BOXES DUE TO FROST ACTION OR SETTLEMENT. FILL MAY BE ADDED TO REPAIR EROSION OR LEVEL SETTLED AREAS.
2. IN GENERAL, SEPTIC TANKS MUST BE PUMPED EVERY 2 TO 3 YEARS (OR MORE FREQUENTLY DEPENDING UPON USAGE). AT LEAST ONCE A YEAR, THE DEPTH OF SLUDGE AND SCUM IN THE SEPTIC TANK BE MEASURED. THE TANK SHOULD BE PUMPED IF:

(A) THE SLUDGE IS CLOSER THAN TWELVE INCHES TO THE OUTLET BAFFLE,
(B) THE SCUM LAYER IS CLOSER THAN THREE INCHES TO THE SEPTIC TANK BAFFLE.
(C) FOLLOWING SEPTIC TANK CLEANING IN UNITS OVER 5,000 GALLONS, SURFACES OF THE TANK SHOULD BE INSPECTED FOR LEAKS AND CRACKS).

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. PLUMBING AND ELECTRICAL COMPONENTS ASSOCIATED WITH PUMP STATIONS OR ADVANCED TREATMENT UNITS MUST BE CHECKED REGULARLY FOR OPERATION AND LEAKS.
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 CROPS AT THE SITE OF ULTIMATE DISPOSAL.
6. FLOW ADJUSTMENT DIALS WITHIN DISTRIBUTION BOXES SHOULD BE CHECKED AND ADJUSTED AS NECESSARY TO ENSURE EQUAL FLOW TO EACH LATERAL. ADJUSTMENT MUST BE PERFORMED WITHIN ONE YEAR OF INSTALLATION AND WHENEVER THE SEPTIC TANK IS PUMPED. FAILURE TO DO SO MAY OVERLOAD AND CAUSE THE PREMATURE FAILURE OF AN ABSORPTION TRENCH OR BED SYSTEM.
7. THE EFFLUENT FILTER IN THE SEPTIC TANK OUTLET BAFFLE SHOULD BE CLEANED (HOSED–OFF) EVERY 3–6 MONTHS OR MORE FREQUENTLY DEPENDING ON USAGE. THE EFFLUENT FILTER MUST BE CLEANED IF SEWAGE BEGINS TO DRAIN SLOWLY FROM THE HOUSE. THE SEPTIC TANK MAY REQUIRE PUMPING IF THE FILTER BECOMES PLUGGED.
8. IMPROPER MAINTENANCE OF THE PRETREATMENT UNIT (SEPTIC TANK) AND RELATED COMPONENTS MAY RESULT IN PLUGGING WITHIN THE DISTRIBUTION NETWORK. THE LIFE OF THE DISPOSAL SYSTEM CANNOT BE ESTIMATED DUE TO A VARIETY OF OPERATIONAL AND ENVIRONMENTAL FACTORS. INTRODUCTION OF MATERIAL OTHER THAN HUMAN WASTES (E.G. USE OF NON–BIODEGRADABLE DETERGENTS, CHEMICALS AND USE OF A GARBAGE DISPOSAL). EXCESSIVE SEWAGE FLOWS OR RAINFALL WILL ADVERSELY AFFECT THE OPERATION OF THE DISPOSAL SYSTEM. SOIL SETTLEMENT, FREEZING OF COMPONENTS AND CLOGGING DUE TO ORGANIC SOLIDS ACCUMULATION WILL REQUIRE REPAIRS.
   - USE OF GARBAGE DISPOSALS IS PROHIBITED UNLESS SPECIFIED OTHERWISE.
   - IMPROPERLY OPERATING WATER SOFTENERS CAN ADVERSELY AFFECT THE OPERATION OF THE SYSTEM. DEMAND–DOSED SYSTEMS ARE RECOMMENDED VERSUS TIME–DOSED. CONNECTION TO A WASTEWATER DISPOSAL SYSTEM SHOULD BE AVOIDED IF POSSIBLE.
9. THE OWNER ASSUMES FULL RESPONSIBILITY FOR THE CONTINUED PROPER USE AND MAINTENANCE OF THE SYSTEM.

NO.	DATE	REVISION	BY

WILLIS DESIGN ASSOC., INC.
P.O. BOX 1001, JERICHO, VERMONT 05465 (802) 858-9228

ROBERT J. & ELSA B.
CARPENTER
530 HILLS POINT ROAD
CHARLOTTE – VERMONT

WASTEWATER SYSTEM DESIGN

DRAWN: JTW	SCALE: NOTED
DESIGN: JTW	
DATE: 9/10/13	SHEET: 1
PROJECT: 13-034	
DRAWING: 13034-1	

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